OCTOBER 1952

The Paper Industry

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DETROIT

WILLIAM L. BARRELL CO.
BOSTON, MASS.

SIAMESE

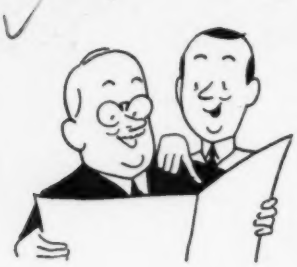
for faster **uniform drying**

WILLIAM L. BARRELL COMPANY

2 CHAUNCY ST., • BOSTON, MASS.

• Siamese and Tour Boss Dryer Felts •

R v.34 Oct. 1952 - Mar. 1953

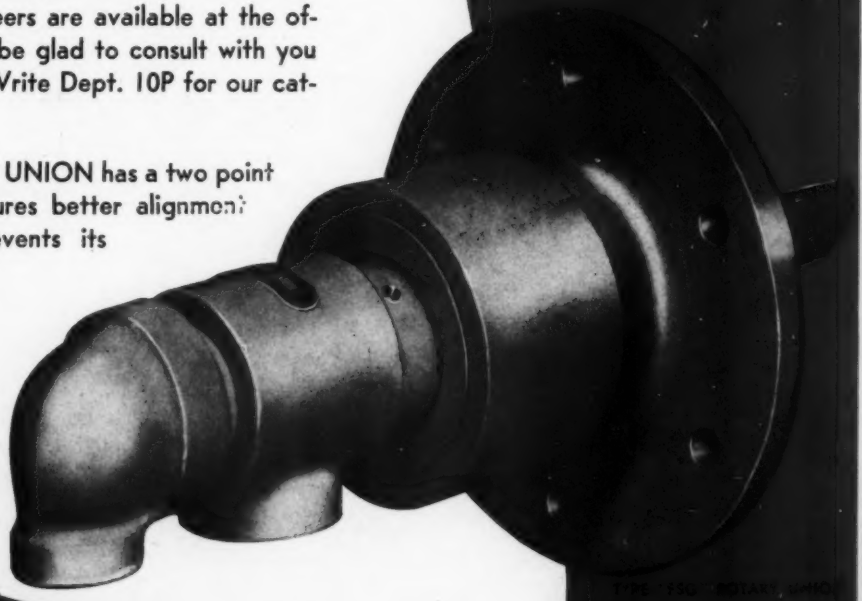


Write for our Catalog

If you are having difficulties with your revolving steam joints on dryers, calenders, digesters, etc. write for our catalog and turn to page 18. The Type "FSG" ROTARY UNION described there will give continuous heavy duty service at high speeds and temperatures and under high pressures . . . *without adjusting or maintenance service of any kind.* Many users report over three years of service without any such attention.

This Type "FSG" ROTARY UNION is only one of 40 models and sizes available for any sealing job where revolving shafts or drums require heating or cooling. Direct factory sales engineers are available at the offices listed below and will be glad to consult with you on any sealing problems. Write Dept. 10P for our catalog today.

This Type "FSG" ROTARY UNION has a two point syphon support which assures better alignment of the syphon pipe, prevents its wearing through and falling off, and eliminates excessive strain on syphon pipe threads.



TYPE "FSG" ROTARY UNION Flange syphon type with a graphite bushing (arrangement supplies no lubrication) in flanged end body of the ROTARY UNIONS revolving with the shaft and with two-point support.

"WHERE *Good Connections* COUNT"

PERFECTING SERVICE COMPANY

332 Atando Avenue (Prime Office and Factory), Charlotte, N. C.

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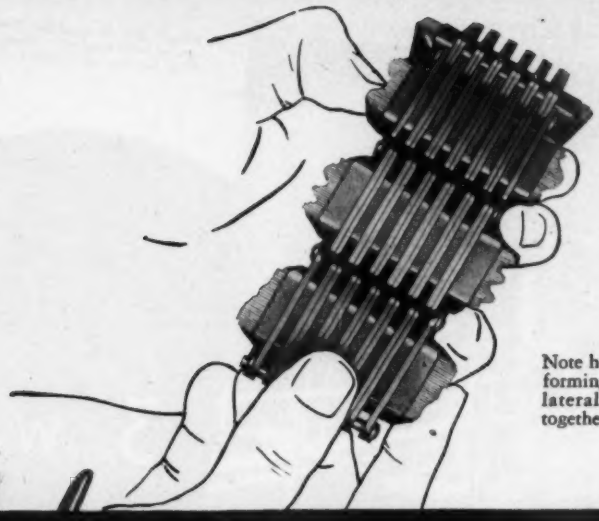
Tech



Note how slats in the self-tooth-forming chain are free to move laterally — either singly or together.

Only **the P.I.V. variable speed drive uses**

SELF-TOOTH-FORMING CHAIN

to give you positive, stepless speed changing

The operation of Link-Belt's P.I.V. Variable Speed Drive is not dependent upon friction for power transmission.

That's because only Link-Belt's P.I.V. has the self-tooth-forming chain that allows *positive,* stepless speed adjustment.

If you've been looking for exact speed changing that will deliver full rated horsepower to your machines, it will pay you to call your nearest Link-Belt branch office, as our representatives are equipped to supply complete detailed information on variable speed transmission.

LINK-BELT P.I.V. VARIABLE SPEED DRIVE

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities.

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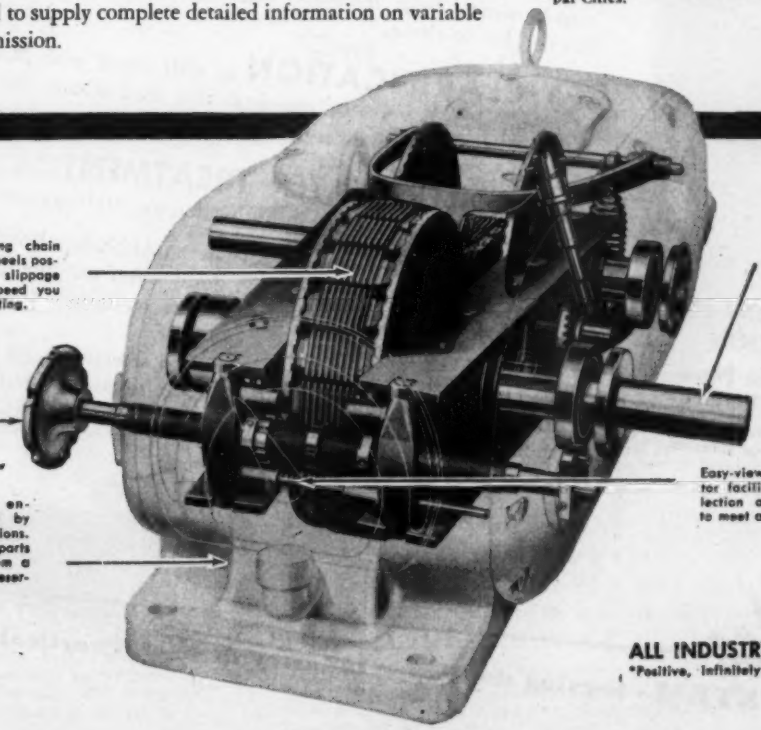


Self-tooth-forming chain grips toothed wheels positively without slippage — gives the speed you need at any setting.

You can get minute speed changes and maintain them accurately while operating under full load.

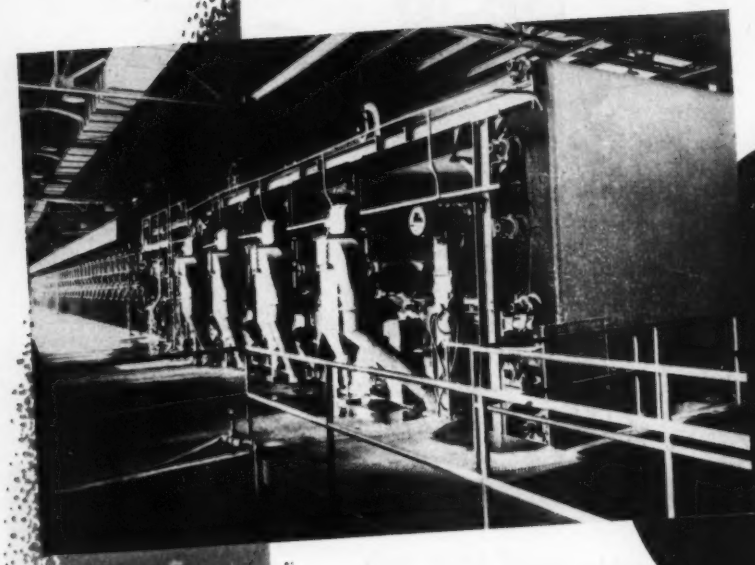
An infinite number of positive, stepless speed adjustments may be made with manual, electric, pneumatic or hydraulic controls.

Easy-view speed indicator facilitates speed selection and adjustments to meet all requirements.

All-metal, totally enclosed — unaffected by atmospheric conditions. All vital operating parts splash-lubricated from a common housing reservoir.

ALL INDUSTRY USES P.I.V.*

*Positive, infinitely variable



Alton's No. 3 machine, world's record strawboard producer. Photo courtesy of Alton Box Board Company, Alton, Illinois.

3 WAY SERVICE

at Alton Box [illegible]ny

HERE are the three water treatment services performed by Nalco at Alton Box Board Company, Alton, Illinois. In addition, experimental work on process waters using Nalco anti-foam chemicals is now being done at Alton:

❶ SLIME CONTROL chemicals, fitted to Alton Box Board requirements, help maintain high quality . . . prevent slime spots and breaks due to slime.

❷ CLARIFICATION of mill water with Nalco #680 Sodium Aluminate . . . A versatile chemical also used widely for size control and maximum alum availability.

❸ BOILER WATER TREATMENT with specially-processed organic chemicals for use in high-capacity, high-pressure boilers.

Use of Nalco Chemicals and Services at Alton Box Board Company shows clearly the wide extent to which good water treatment, properly applied, can be utilized to make over-all mill operation cleaner, more efficient and more economical.

The Nalco System can be applied selectively, or for complete water treatment protection in *your* mill. Write today for full details on your specific water treatment problems.

NATIONAL ALUMINATE CORPORATION
6232 West 66th Place
Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario

THE Nalco SYSTEM • Serving the Paper Industry through Practical Applied Science

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 34 • NUMBER 7 • OCTOBER, 1952

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The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

Copyright 1952, by Fritz Publications, Inc.

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), Founder

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THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950, issue.

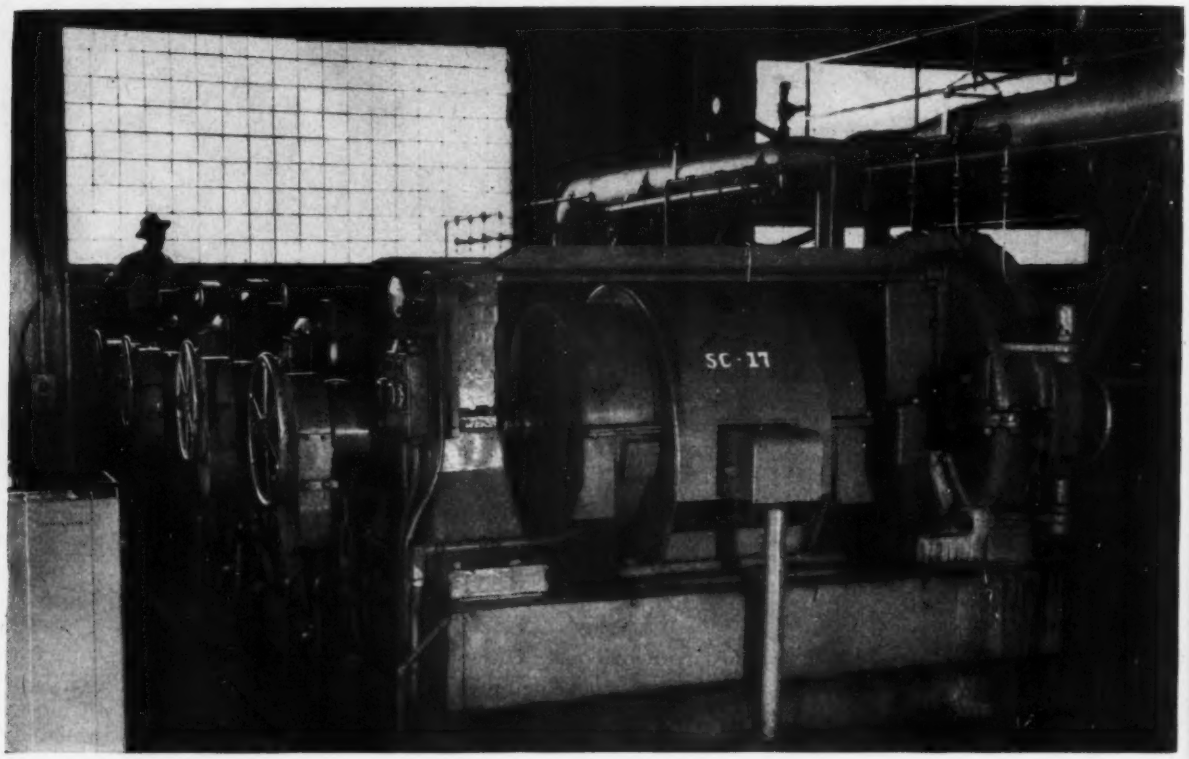
Published at 404 North Wesley Avenue, Mount Morris, Illinois.

Address all correspondence intended for publication to Editorial and Executive Office, 431 South Dearborn Street, Chicago 5, Illinois.

Member: Audit Bureau of Circulations, The Associated Business Publications.

Entered as second class matter December 13, 1948, at the post office at Mount Morris, Illinois, under the Act of March 3, 1879.

Subscription rates: United States, U. S. Possessions, and Canada, $3.00 for one year, $5.00 for two years, $6.00 for three years. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.



What a paper mill discovered about E-M Synchronous Motors

When a North Carolina pulp and paper company recently installed the four refiners shown above, driven by 400 hp, 900 rpm E-M Synchronous Motors, the company discovered some important advantages of E-M Motors.

1. **PROFITABLE OPERATION:** They found that the synchronous motors, operating at a leading power factor of 0.8, offset a large amount of lagging power factor from the induction motors in the mill. This way, the E-M Synchronous Motors raised the total over-all mill power factor, thus helping to provide most favorable conditions for minimizing electric power billings.

2. **MINIMUM MAINTENANCE OPERATION:** This North Carolina mill discovered that E-M splash-proof construction gave the motors highly desirable protection for refiner operation. Keeping water out of the motors is a big factor in keeping them clean and dry . . . prolonging life of the motor windings and minimizing maintenance.

3. **RELIABLE OPERATION:** Finally, E-M Synchronous Motors are heavy-duty engineered for the special conditions of paper mill operation. They'll work around the clock—important in pulp refinery operations where failure of one motor might interfere with production of the entire mill.

Skilled E-M engineers have had many years of practical experience in designing and installing synchronous motors for paper and pulp mills. Will you let E-M engineers show you how synchronous motors can increase the electrical efficiency of your mill?

ELECTRIC MACHINERY MFG. COMPANY
MINNEAPOLIS 13, MINNESOTA

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SPECIALISTS IN BIG MOTOR ENGINEERING

Now, more than ever, valves must be DEPENDABLE

In these days when peak production is so essential, you can't afford to have your operation interrupted by the failure of a valve. Powell Valves are designed and made to stand up under even the most exacting service conditions.

The Wm. Powell Company
Cincinnati 22, Ohio

Fig. 2608. 200-pound Bronze Globe Throttling Valve. A Powell design that permits full flow through the seat when wide open. Has special bronze stem and stainless steel disc and seat.

POWELL

BRONZE, IRON, STEEL AND CORROSION-RESISTING VALVES

DEPENDABLE VALVES SINCE 1846

BECCO
PEROXYGEN
CHEMICALS

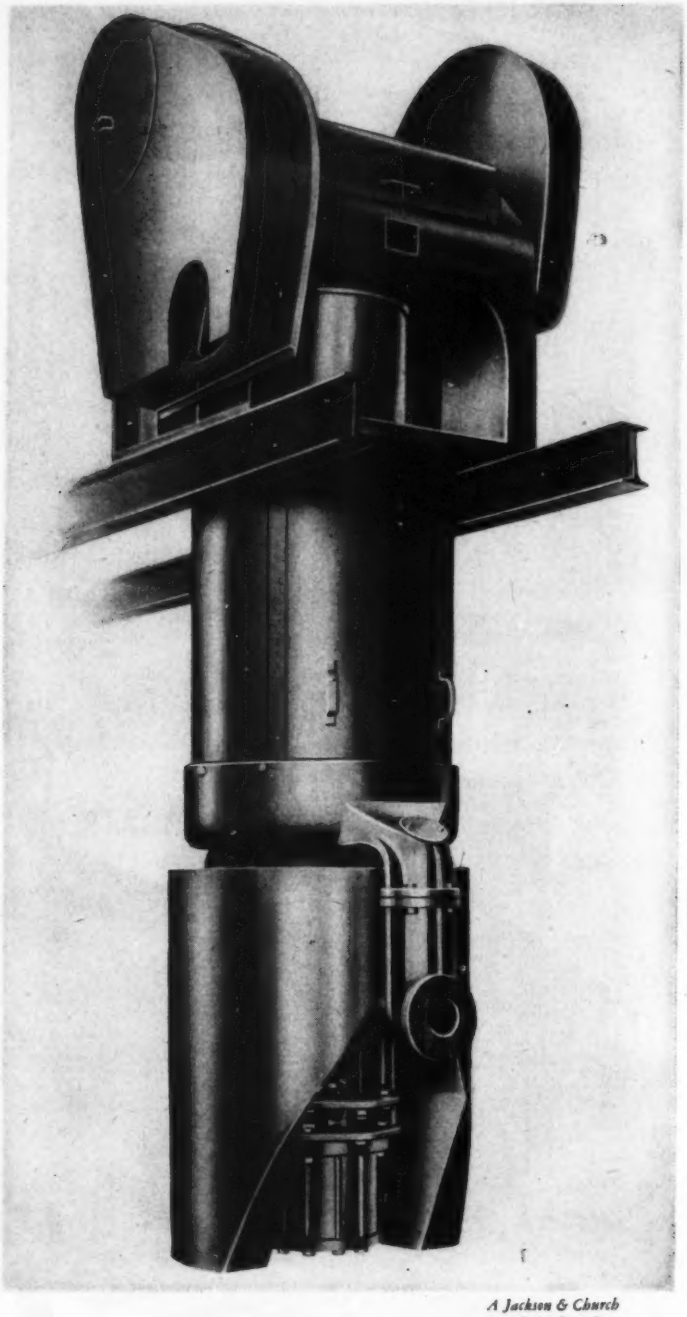
You Can Now Bleach Crumbs with Hydrogen Peroxide at High Density!

Continuous bleaching with Hydrogen Peroxide at 25%-40% density is now a reality for groundwood, semi-chemical, and chemical pulps in crumb form.
Semi-continuous steeping of these pulps without retention towers is also a commercial operation.
Screw presses will perform the function of de-watering to high densities.

The systems are characterized by their simplicity and low floor area requirements.

To obtain the same brightness level, chemical cost reductions due to high density operation (25%-40%) have been up to 20% for groundwood, up to 25% for neutral sulfite semi-chemical, and up to 45% for sulfite, compared with moderate density (10%-14%) systems.

For further information on the most efficient peroxide methods, write to Becco.



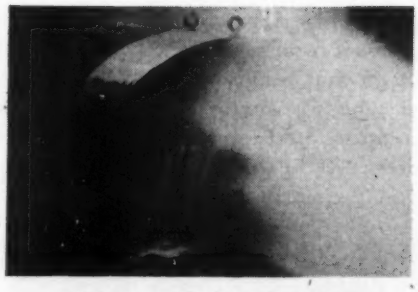
A Jackson & Church Zenith Medium Press typical for use in de-watering high density pulp crumbs.

Buffalo Electro-Chemical Company, Inc.

fmc
DIVISION OF FOOD MACHINERY AND CHEMICAL CORPORATION
Sales Agent: BECCO SALES CORPORATION, Station B, Buffalo 7, N.Y. • Buffalo • Boston • Charlotte • Chicago • New York • Philadelphia • Vancouver, Wash.

Cramped for space?
PUT THAT NEW PUMP OUTDOORS!

ELLIOTT Outdoor Splashproof MOTOR



IT'S DELUGE-PROOF!

Elliott outdoor splashproof motor undergoing operating test under torrents of water, going strong after hours of deluge. When disassembled, windings were found completely dry.

● Weather doesn't matter to this motor. It gives you all the immunity to climatic extremes of totally enclosed construction, without the need for the expensive and complicated ventilation provisions of that design. A series of ingenious baffles shuts out snow, rain, sleet, dust, debris, fog, salt spray, etc., permitting entrance to cooling air only. For extremely dust-laden air, filters can be provided. No cored foundation is needed — a simple slab suffices.

This motor has proven itself in hundreds of outdoor installations in all parts of the country. Sizes from 150 hp to 3000 hp and even higher. Full details in the bulletin. Contact your local Elliott representative, or write Elliott Company, Ridgway, Pa.

ELLIOTT Company

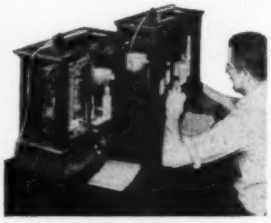
R2-25 **RIDGWAY DIVISION**

ELLIOTT ELECTRICAL EQUIPMENT INCLUDES CROCKER-WHEELER INDUSTRIAL MOTORS

No need to gamble on evaporator tubes!

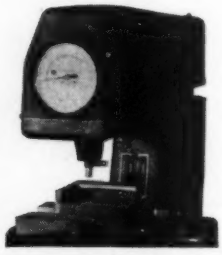
The Timken Company shows you what you get

Specifications for 3½% and 5% nickel tubes are available to you with no obligation.

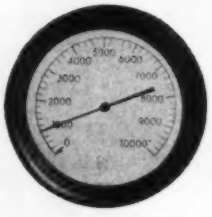


Special chemical composition test of your order is made at your request.

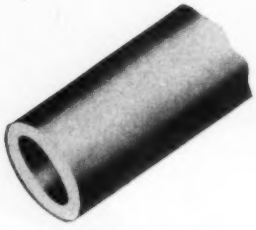
In flaring test, tube I.D. must expand 20% without cracking or showing flaws.



Tubes must have Rockwell hardness number not exceeding B89.



Each tube is tested under hydrostatic pressure of 1,000 p.s.i. before shipment.



Tubes must be free from defects and have workmanlike finish. Inspection is rigid.

Tolerances in O.D., wall thickness, cut length are held to a minimum.

Purchaser has free entry to plant for inspection of work on contract.

. . . and guarantees you'll get it!

THERE'S no guesswork in buying black liquor evaporator tubes when you buy them from the Timken Company. Specifications for Timken® 3½% and 5% nickel steel tubes show you exactly what you get. They cover every essential point—chemical composition, physical properties, inspection methods and tests to which the tubes are subjected (see above).

And the Timken Company guarantees that every order of tubes will meet these high specifications. Quality is controlled at every step. Tubes are tested and inspected before shipment. As a result, you reduce tube replacement costs, save tube sheet wear, cut downtime. Write on your company letterhead for 3½% and 5% nickel tube specifications. The Timken Roller Bearing Company, Steel and Tube Div., Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

practical CONSERVATION

It's easy to see why Sutherland High Yield Systems* impress papermakers as the most *practical* means of conservation yet developed by the industry. Here are some of the reasons:

1. **Thousands of acres of trees can be left growing, thus producing more wood for tomorrow.**
2. **Substantial savings can be made in the cost of paper produced.**
3. **Installation costs in the average mill are well below the earnings in the first year of operation.**

Why not find out what Sutherland can do for your timber reserves, your quality of product, and your profit per ton? Our experts on practical conservation will be glad to give you the answers . . . write or wire us today.

SUTHERLAND

continuous beating systems

*U. S. Patent No. 2,591,106

Designed, Engineered, Serviced

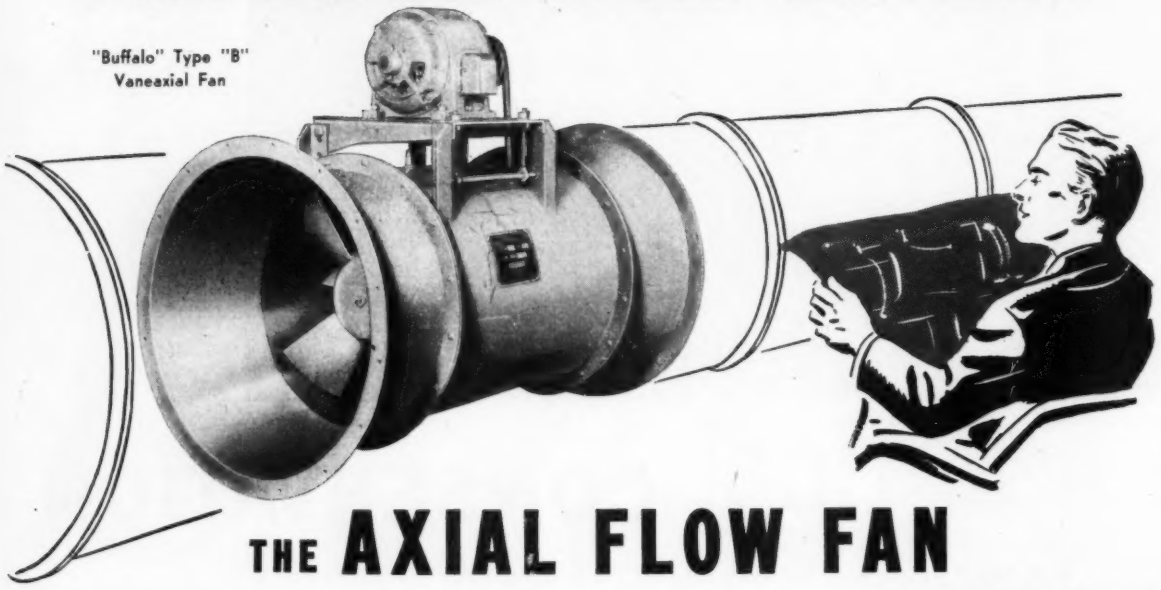
***by* SUTHERLAND REFINER CORPORATION**

TRENTON 8, N. J.

"Buffalo" Tips on Getting the Best Service from your Fans

PICK THE FAN TO SUIT THE PLAN!

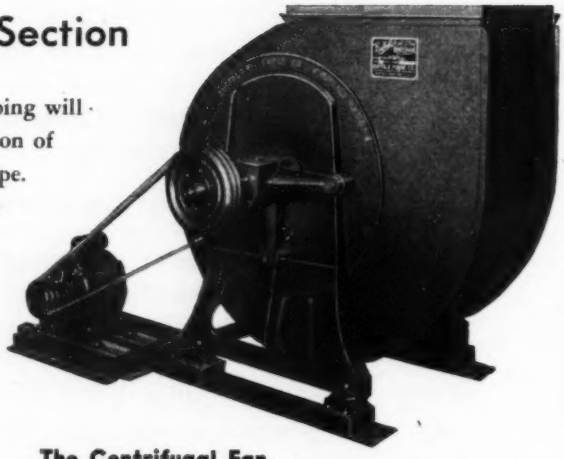
"Buffalo" Type "B" Vaneaxial Fan



THE AXIAL FLOW FAN

Forms a Straight Duct Section

For ventilating and Air Conditioning service, where your piping will be straight, this Axial Flow Fan is ideal. Fitting in as a section of pipe, it requires little more cubic space than does the pipe. "Buffalo" Fans like the Type "B" Vaneaxial above, are also relatively light, which reduces installation cost. Also, this type of fan is unusually efficient in these straight duct runs. Another advantage in "Buffalo" Axial Flows is their limit-load characteristic — you cannot overload them, regardless of system pressure.



For Performance Curve and other useful information on "Buffalo" Axial Flow Fans, write today for Engineering Bulletin 3533-C.

The Centrifugal Fan, like this "Buffalo" Limit-Load Fan, forms a built-in 90-deg. elbow. If your system is to have many curved connections, consider this type of fan. Details are in Bulletin 3737. Write for your copy.

"Buffalo" FIRST FOR FANS

BUFFALO FORGE COMPANY

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Your welders will seem like *Siamese Twins*

When they use Midwest Welding Fittings, your welders will turn out so much more work that they'll seem like Siamese Twins. The reason? . . . The exceptional accuracy and uniformity of Midwest Welding Fittings enable your welders to spend more time welding and less time in preparation.

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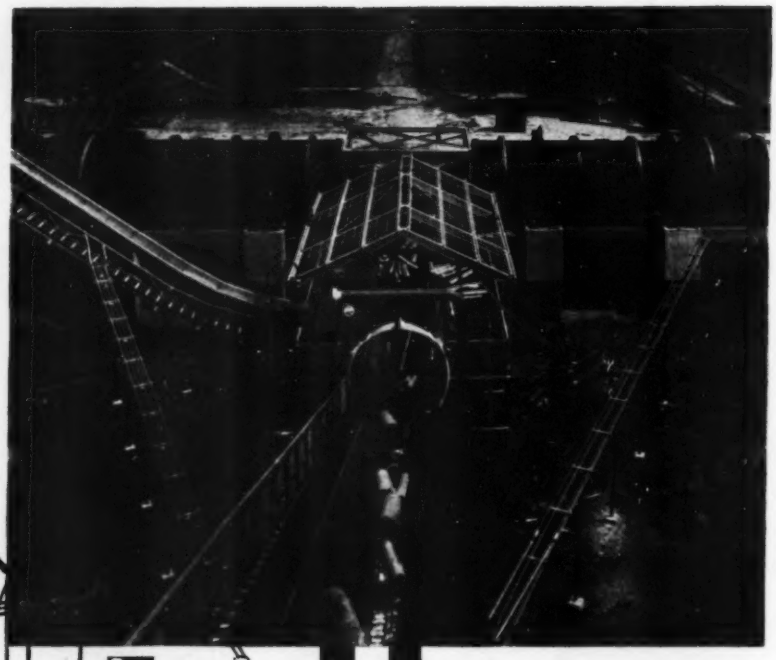

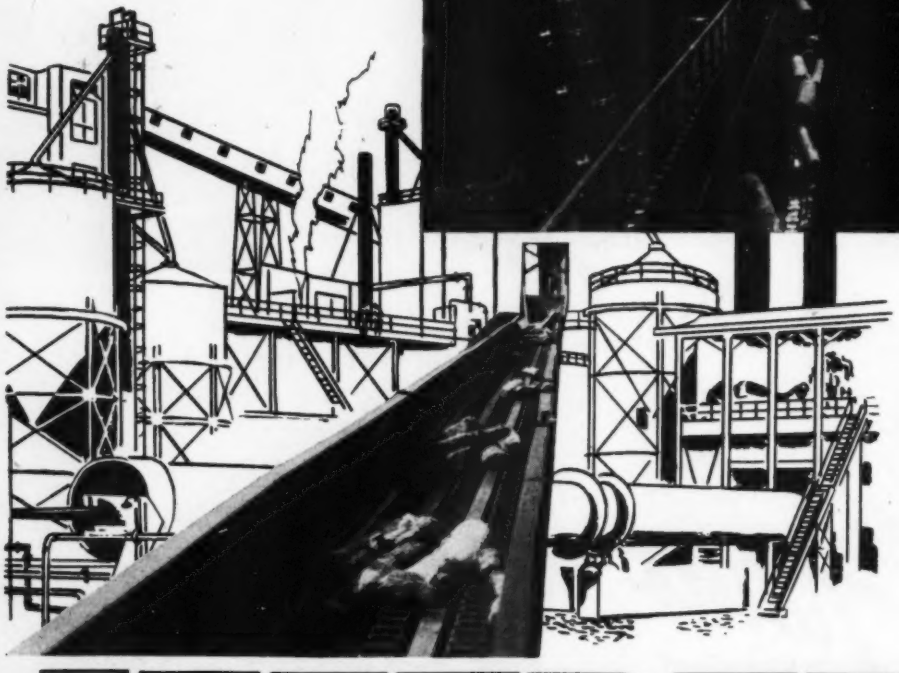

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Belt Conveyors
Spiral Conveyors
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Barge Unloaders
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Log Haul-ups
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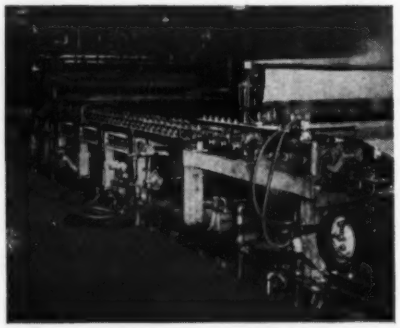
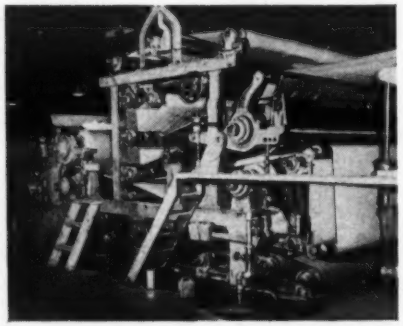
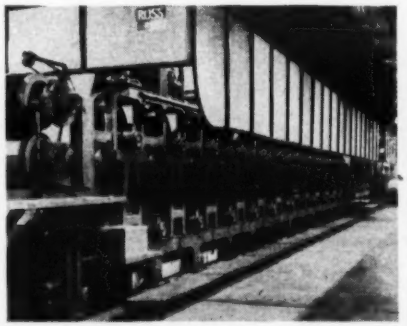
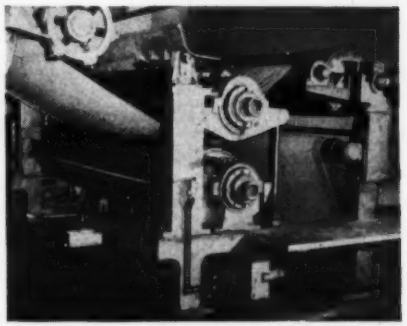
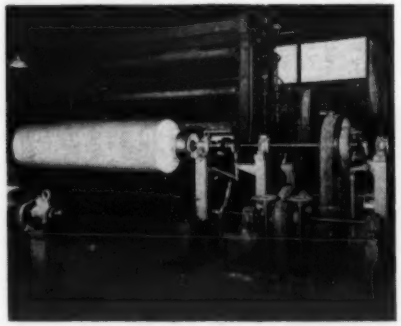
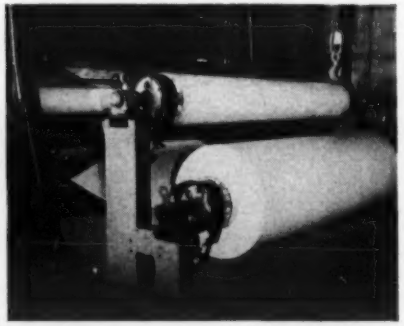
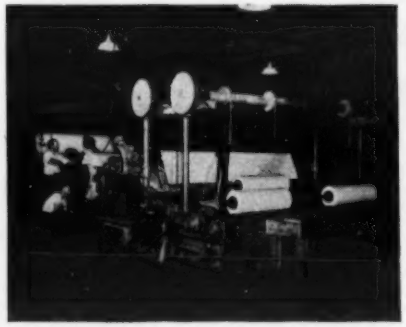
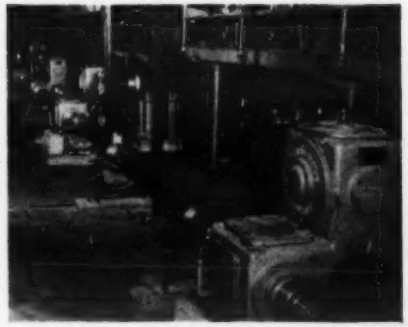
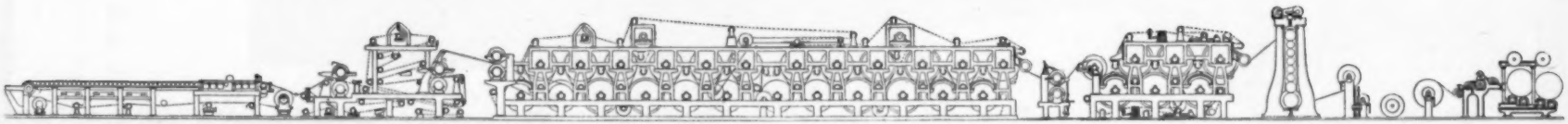









Latest Moore & White Fourdrinier machine with 136" wire operating on specialty grades at Hopper Paper Co., Taylorville, Ill. Above views show various machine sections and Moore & White Syco-type machine drive.



The MOORE & WHITE Company 15TH STREET AND LEHIGH AVENUE PHILADELPHIA 32 PA. • CUSTOM-BUILT MACHINES FOR PAPER MAKERS

R-S valvEvents

• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •

For Operating Ease in Inaccessible Locations

INSTALL R-S CHAINWHEEL VALVES

Few Chainwheel Turns. R-S Valves are completely closed from the fully open position by the movement of the valve vane through 77½° of arc. Operating ease is one of the chief advantages of R-S Valves.

Economy in First Cost. R-S narrow face-to-face design results in minimum number of working parts, less metal, less machining, lower weight and less supporting structure—hence economy in first cost.

Accurate Engineering. Body assemblies are accurately engineered mechanically and metallurgically. A. S. A. standards are equaled or exceeded in every detail.

Low Pressure Drop Saves Power. In the open position the streamlined vane causes a Venturi action. Pressure drop is therefore exceptionally low. Pumping costs are reduced accordingly.

More Control Rangeability. Power-controlled prime movers delivering 15 foot-pounds to 38,000 foot-pounds of torque open or close at any desired speed. Full closure requires one second to ten minutes depending on requirements and the type of material controlled. Positive shut-off is obtained with a rubber seat.

Self-cleaning. There are no pockets to house sediment, no change of flow direction to create turbulence or wire drawing and therefore less likelihood of erosion and cavitation.

Maintenance Practically Nil. Every R-S Valve is designed and constructed for rugged service and provided with safety factors to give complete satisfaction in the service for which it is designed. Packing trouble is not common to R-S Valves since the shaft moves only with an oscillating motion.

Consult your local R-S Valve Engineers, or write direct.

R-S PRODUCTS CORPORATION • 4600 Germantown Ave., Philadelphia 44, Pa.

An S. Morgan Smith Company Subsidiary

DISTRICT OFFICES IN PRINCIPAL CITIES

Plus 10% increase in production

That's the record of a 3-machine Mexican Mill,* after installing the Jones equipment shown in the flow-chart above.

Three Jones High-Speed Refiners and one Standard Jordan replaced two 250-h.p. refiners and two 150-h.p. Jordans when this mill modernized the stock preparation for its largest paper machine — making about 20 t.p.d. of sulphite bonds and 12 to 14 t.p.d. of manifold papers.

The new installation has increased production by 10% while producing equal or better quality papers. Why don't *you* find out what the Jones High-Speed Refiner can do for your cost and quality controls? Ask your Jones representative or write direct for Bulletin EDJ-1011B.

**Name on request*

MR. C. H. VICKERY, Sales Manager of E. D. Jones & Sons Co., says:

"This example, typical of many in our files, helps explain the popularity of this versatile, highly economical refiner. More than 1000 of these 'mighty mites of stock preparation' have been sold (not including those made by imitators!) since it was introduced in 1935."

E.D. Jones

E. D. JONES & SONS COMPANY
Pittsfield, Massachusetts

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

HAM FELTZ says:

The water goes through BETWEEN the woolen threads...

Yes, I've seen those Hamilton people begin with a mass of dirty wool, right from the backs of sheep. They wash it clean and card it as straight as string and as fine as cobweb. Then they spin it into yarn, soft and strong, without knots or kinks.

From the spindles this woolen yarn travels to the looms. The shuttles fly from side to side, sometimes as much as fifty feet, to weave the fabric for Hamilton Felts. With a magnifying glass you can see the open spaces between threads.

The number, size and shape of these open spaces determine how fast the water can be squeezed out by the nip of the press. The more water you remove at the wet end of your machine, the less you have to cook out at the dryers.

With more than 300 different styles from which to choose, the Hamilton Sales Engineer who contacts you may be in position to recommend a felt that will do your work better, faster and at lower cost.

Hamilton Felts

MIAMI WOOLEN MILLS

Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO

FAWICK CLUTCHES DELIVER SMOOTH, DEPENDABLE POWER ON BLACK-CLAWSON DRIVES

IT WOULD take thousands of words to describe all the advantages that FAWICK AIRFLEX CLUTCHES provide on paper mill drives. However, *nothing speaks better than performance.*

The smooth action and dependable operation of FAWICK CLUTCHES *plus* their low maintenance requirements provide important reasons why the Black-Clawson Company uses them on their drives. That's why they've used FAWICK CLUTCHES since 1944.

For increased production — through faster, more sensitive action on your sectional drives or on your paper converting machinery, use performance-proved FAWICK AIRFLEX CLUTCHES.

The Black-Clawson Company Spiral-bevel Gear Drives Including FAWICK Type CB Airflex Clutches.

For further information on Fawick Industrial Clutch and Brake Units, write to the Main Office, Cleveland Ohio, for Bulletin ML-22.

The FAWICK AIRFLEX COMPANY, Inc.
9919 CLINTON ROAD • CLEVELAND 11, OHIO

FAWICK Airflex
INDUSTRIAL CLUTCHES AND BRAKES

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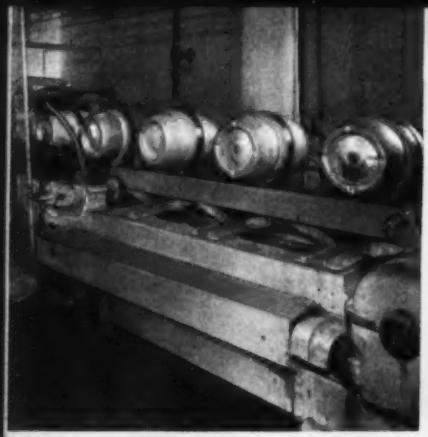
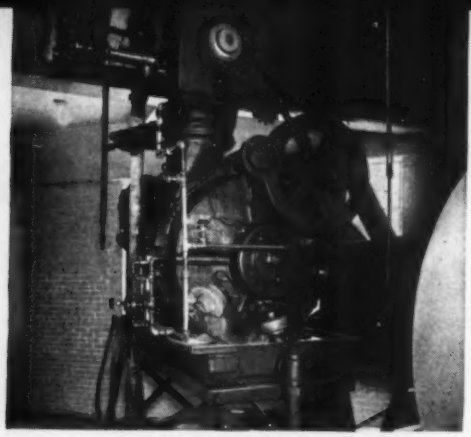
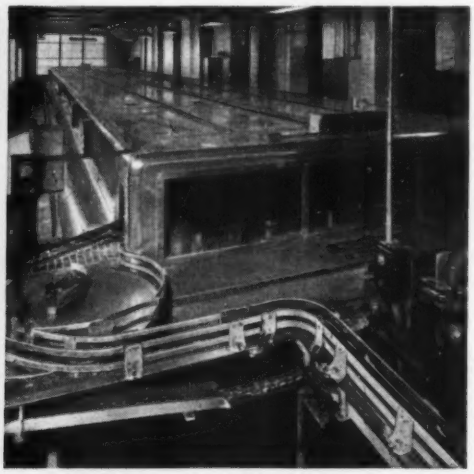


Keg scrubber—A constant stream of water at 130°F. plays over these barrels and reaches bearings on conveyor.



Wet-grain press—After being heated to 180°F., grain is then pressed dry. Hot water comes in contact with bearings.

Bottle soaker and washer—Bottles are first cleaned with strong alkali at 180°F., then washed with water. These conditions make bearing lubrication difficult.



Pasteurizer—Beer is pasteurized in this modern machine which is subjected to constant water spray ranging from 80°F. to 140°F.

No trouble brewing for bearings!

A midwest brewing plant employed seven different greases in a variety of applications. Despite the use of these special products, the operators experienced difficulty. The greases would not withstand both water and high temperatures. Frequent applications were necessary.

A Standard Oil lubrication specialist was called in on this problem. Upon his recommendation, STANOLITH Grease—a lithium-soap product with the ability to withstand both heat and water—was given the job.

As a result, STANOLITH has replaced all seven greases formerly used and *has done a better job in each type of application.* Through its use over a two-year period, grease consumption has been reduced 20% and time spent in applying grease cut 50%.

STANOLITH Grease can prove its remarkable versatility in your plant, too. Its high mechanical and chemical stability plus its extreme resistance to heat and water qualifies it to replace a variety of special greases.

STANOLITH
TRADE MARK
Greases

To obtain maximum benefits from STANOLITH, use the services of a Standard Oil lubrication specialist. His headquarters are near your plant. How you can benefit by his on-the-spot service is explained at the right. Standard Oil Company, 910 South Michigan, Chicago 80, Illinois.

What's YOUR problem?

Mr. D. V. Wills of Standard Oil's South Bend office is the lubrication specialist who helped this Midwest brewing company solve a difficult lubrication problem.

He is one of many Standard Oil specialists located throughout the Midwest. These men have the practical experience and special training to handle lubrication problems on any type of operation.

Take advantage of the service offered by the lubrication specialist nearest your plant. You can reach him by phoning your local Standard Oil Company (Indiana) office. Why not call, today, and arrange to discuss with him the advantages offered you by STANOLITH and other outstanding products such as:

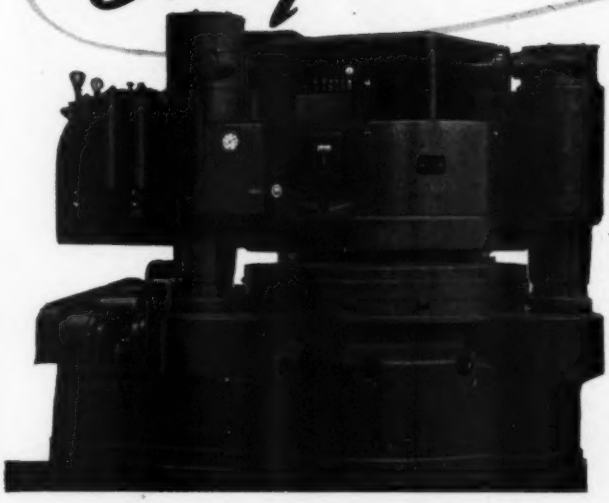
STANOIL Industrial Oils—This general-purpose line of oils provides cleaner operation of hydraulic units and supplies effective lubrication in compressors, gear cases, and circulating systems. One or two grades can replace a wide variety of specials oils and lubricants.

SUPERLA Greases—Available in a wide range of consistency grades and in both lime-soap and soda-soap types, SUPERLA Greases cover a wide range of applications. These efficient products are comparable in quality with the highest type of special greases.

STANORUST Rust Preventives—The eight grades of STANORUSTS form one of the most complete and effective lines of rust preventives on the market today. Each has been scientifically developed for its intended use. The grades range from a fingerprint remover to a heavy petrolatum that protects against corrosion for years under the most severe outdoor exposure.

STANDARD OIL COMPANY STANDARD *(Indiana)*

Only CURLATOR can . . .



INCREASE PULP YIELD UP TO 10%

ELIMINATE ALL FIBER BUNDLES AND REDUCE DIRT

IMPROVE PULP QUALITY

CUT COST

AND STILL RETAIN FREENESS AND FIBER LENGTH

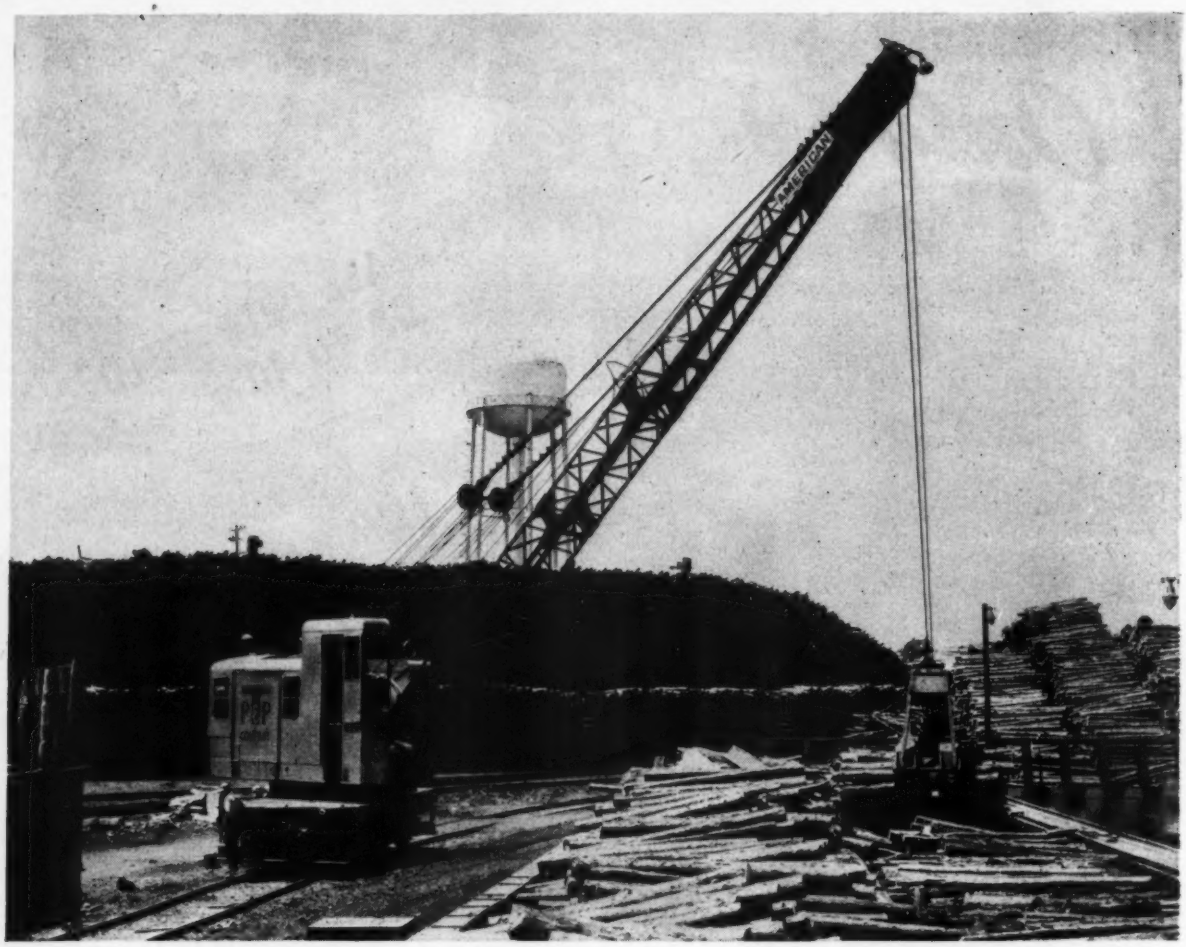
Curlators are increasing pulp yield as much as 10% in commercial operation, where sulphite pulp is used in unbleached papers. When sulphite pulp is used in bleached papers the increase in yield is not quite as great.

Because Curlation does not reduce fiber length the rejections from fine screens can be increased to obtain improved cleanliness, and these rejects can then be Curlated and returned to the system for the production of additional No. 1 pulp.

Only with the Curlator can you increase pulp yield, eliminate all fiber bundles, reduce dirt, improve quality and cut cost, without affecting fiber length and freeness. No other mechanical equipment yet devised can do all these things.

CURLATOR†
Corporation
EAST ROCHESTER, NEW YORK

†T. M. Reg.—Curlator Corporation, Rochester, N. Y.



Winner and still champion in the pulpwood handling field

Can you think of a tougher materials-handling job than storing and handling pulpwood? Here, your yard superintendent must unload his cars at a high-speed clip . . . and stack the wood to dizzy heights, to save ground space . . . and service a storage yard immense in area . . . and yet keep his cost per ton down to rock bottom.

In view of these facts, it is a wonderful tribute to American Locomotive Cranes that they are such great favorites in the nation's pulp and paper mills. Today, as for many years past, they are the No. 1 choice of the industry.

The reasons are clear and compelling. American Locomotive Cranes need only a one-man "crew". They can travel great distances at top speed while swinging, booming and lifting simultaneously. Maintenance costs have been cut most remarkably . . . and "down" time has almost completely vanished.

Why not compare your present pulpwood handling costs with the records of the new American Diesels and DiesELectrics. We'll be glad to furnish facts and figures for your study.

2608

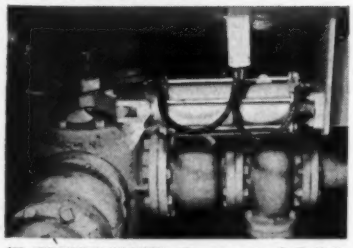
Modernize...economize...with

American Hoist
& Derrick Company
ST. PAUL 1, MINNESOTA

For the BIG PRODUCTION jobs of industry...

AMERICAN LOCOMOTIVE CRANES

IN SEWAGE PLANTS, these electrically-timed, fully-automatic, air-cylinder operated a.c.f. Valves shear obstructions.



IN CHEMICAL PLANTS air-operated a.c.f. Valves offer super-dependability...self protected from abrasive and corrosive action.

IN THE STEEL INDUSTRY a.c.f. Valves provide split-second control of fuel oil and gas to furnaces and coke ovens.

SPLIT SECOND ROBOT CONTROL

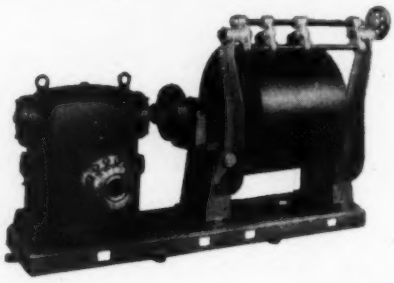
a.c.f. CYLINDRICAL Plug Valves are ideal for all types of automatic operation: hydraulic, electrical, or air operated. The quick quarter-turn from full-open to full-closed is always sure as there's no wedge effect to cause jamming in the seat. In addition, all bearing surfaces are lubricated for easy turning. Sound reasons to insist on a.c.f. Plug Valves for all automatic valve operations.

a.c.f. CYLINDRICAL FULL PIPE AREA PLUG VALVES

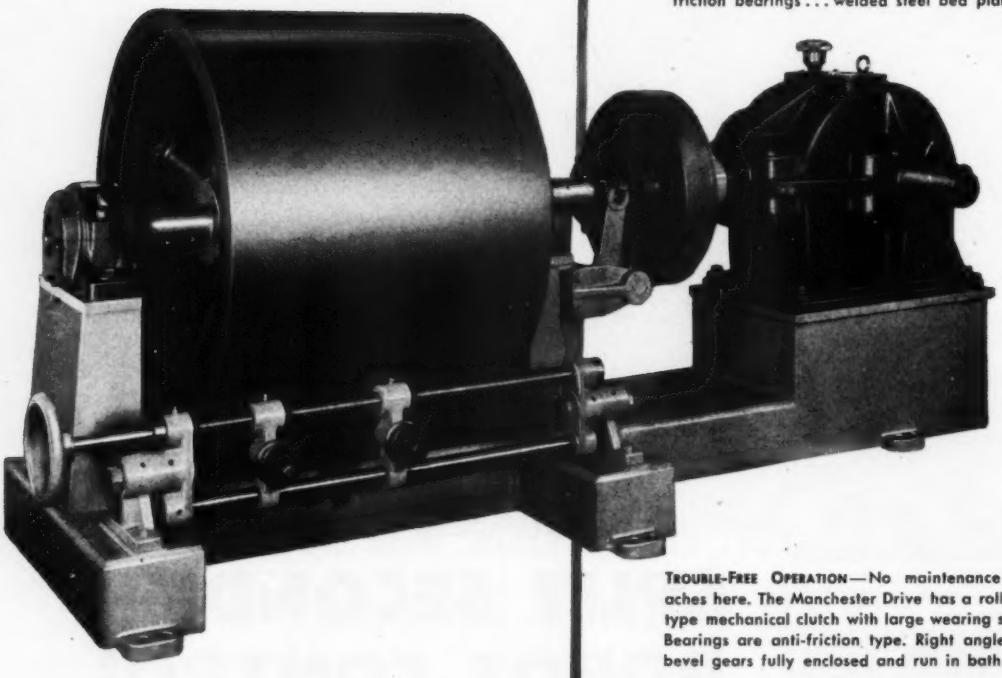
Write for Catalog 4-PI, American Car and Foundry Co. Valve Division, 1501 E. Ferry Ave., Detroit 11, Michigan

Representatives in 50 Principal Cities

Machine *speed* measures your *profit*



ENGINEERED FOR CONTINUOUS DUTY—The Manchester Drive has totally enclosed, highly efficient spiral bevel gears running in a bath of oil . . . double arm return flange taper cast iron pulley . . . anti-friction bearings . . . welded steel bed plate.



TROUBLE-FREE OPERATION—No maintenance headaches here. The Manchester Drive has a roller grip type mechanical clutch with large wearing surface. Bearings are anti-friction type. Right angle spiral bevel gears fully enclosed and run in bath of oil.

How much would it cost to install a Manchester Paper Machine Drive to get greater speed and higher production? How long would your machine be down for the change?

If these are some of the questions you would like to have answered, we shall be glad to give you the whole story promptly — and without the slightest obligation.

Manchester Paper Machine Drives are engineered for the job *you* want them to do. These right angle paper machine gear drives are designed and built for rugged continuous duty.

Before you buy another drive, get the complete Manchester story. And be sure to write us for a free copy of our useful catalog.

A Few Other Manchester Products

DRUM WINDERS • ADJUSTABLE SHAKE MOTION • POPE TYPE REELS SUCTION PRESS ROLLS • SIZE PRESSES • RUBBER-COVERED DRILLED SUCTION DRUM ROLLS • DRILLED SUCTION COUCH ROLLS • CYLINDER MOULDS • COMPLETE FOURDRINIER • ROLL GRINDING

THE MANCHESTER MACHINE COMPANY

1710 CENTRAL AVENUE • MIDDLETOWN, OHIO

SPECIALISTS IN PAPER MILL MACHINERY AND COMPLETE REPAIR SERVICE

This is Controlled Volume Pumping
An automatic alum dilution system in which 450 gallons per hour of concentrated alum solution is pumped to dilution water to give dilute alum size. Discharge Pressure: 50 psi.

THIS MILTON ROY CONTROLLED VOLUME PUMP DOES THE JOB . . .

This automatic alum dilution system is only *one* application for Milton Roy Controlled Volume Pumps. Elsewhere in the paper industry, these units are used in automatic systems of rosin size emulsification, automatic caustic dilution systems, slime control, continuous pulp digestion—with measurable returns in accuracy, efficiency, and dollar savings. They have further application as components of blending and formulating systems, for precise metering of additives, automatic pH control, and for operations requiring the constant feeding of chemicals. They handle practically any liquid—slurries, viscous materials, fibres in suspension, acids, alkalies. As air-powered or motor-driven units, as components of automatic systems, complete with a variety of automatic controls, these pumps put processing operations on an accurate, automatic basis.

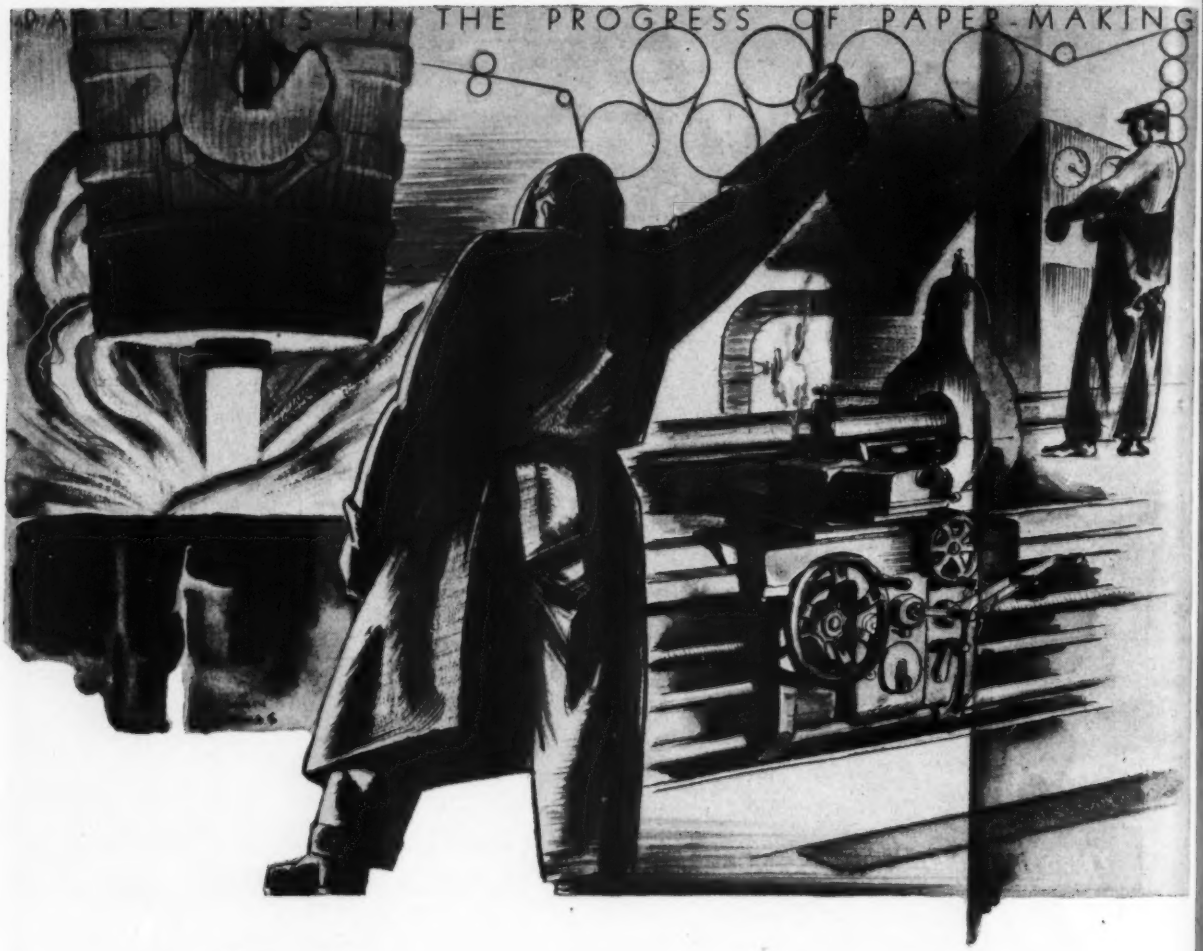
For detailed information, call the Milton Roy representative listed in your classified telephone directory. Or write us direct.

WITH THE EXCLUSIVE STEP-VALVE DESIGN

MILTON Roy COMPANY

1316 EAST MERMAID LANE, PHILADELPHIA 18, PA.

MANUFACTURERS OF CONTROLLED VOLUME PUMPS AND AUTOMATIC CHEMICAL FEED SYSTEMS

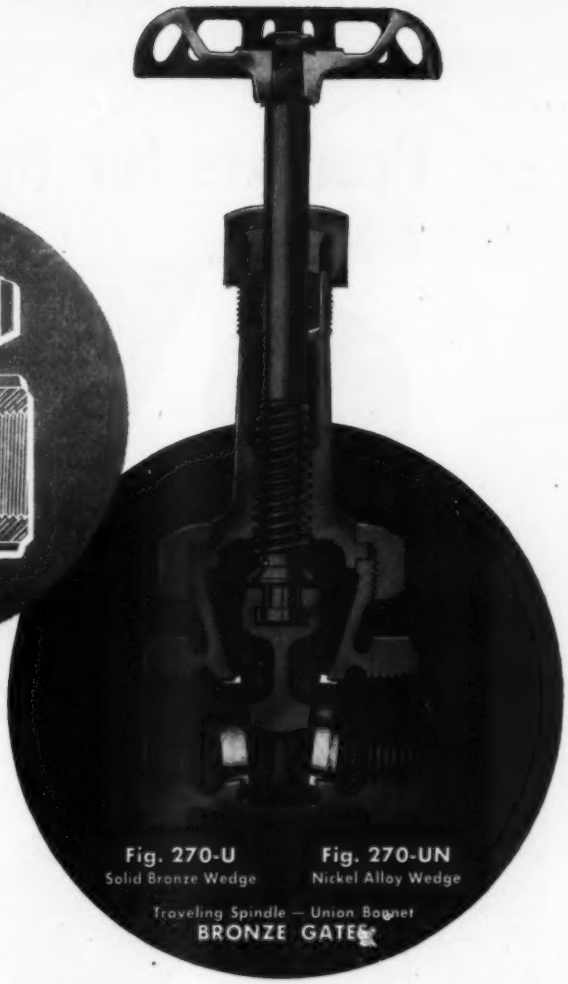


Machinery . . . paper-making equipment traditionally combining original design and extremes of size with high speed operation, precision and durability . . . implements a great industry.

Fourdrinier Wires . . . as fabricated by Appleton Wire Works, Inc., reflect the 56 years of experience and devoted research that have *earned* the acknowledgement that *"Appleton Wires are Good Wires!"*

APPLETON WIRE WORKS, INCORPORATED • APPLETON, WISCONSIN

Built-in $AVING$ make JENKINS BRONZE GATES your BEST BUY

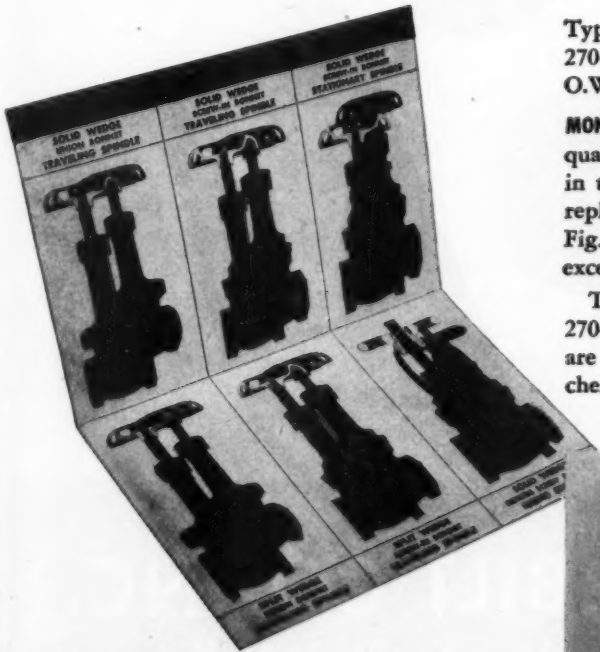


Look over any of the 35 patterns in your complete line of Bronze Gates. You'll find *savings* built into every valve. Jenkins valve specialists designed each one for easy maintenance and extra long wear. Try them on your toughest services and see why they take top-rating in any test for endurance and economy. Jenkins Bros., 100 Park Ave., New York 17.

Typical of Jenkins design for built-in savings are the Fig. 270-U and Fig. 270-UN Gates for 200 lb. Steam, 400 lb. O.W.G. services.

MONEL AND BRONZE SEATING COMBINATION In Fig. 270-U a high quality bronze wedge seats against MONEL rings expanded in the body. The wedge takes the wear — it can easily be replaced when necessary by slipping a new one on the stem. Fig. 270-UN, with a nickel alloy wedge, is recommended for exceptionally severe conditions of rapid wear and corrosion.

These and other features of rugged construction make Figs. 270-U and 270-UN first choice for economy where conditions are most destructive to valves, as in oil refineries, dye houses, chemical, food, and rubber plants.



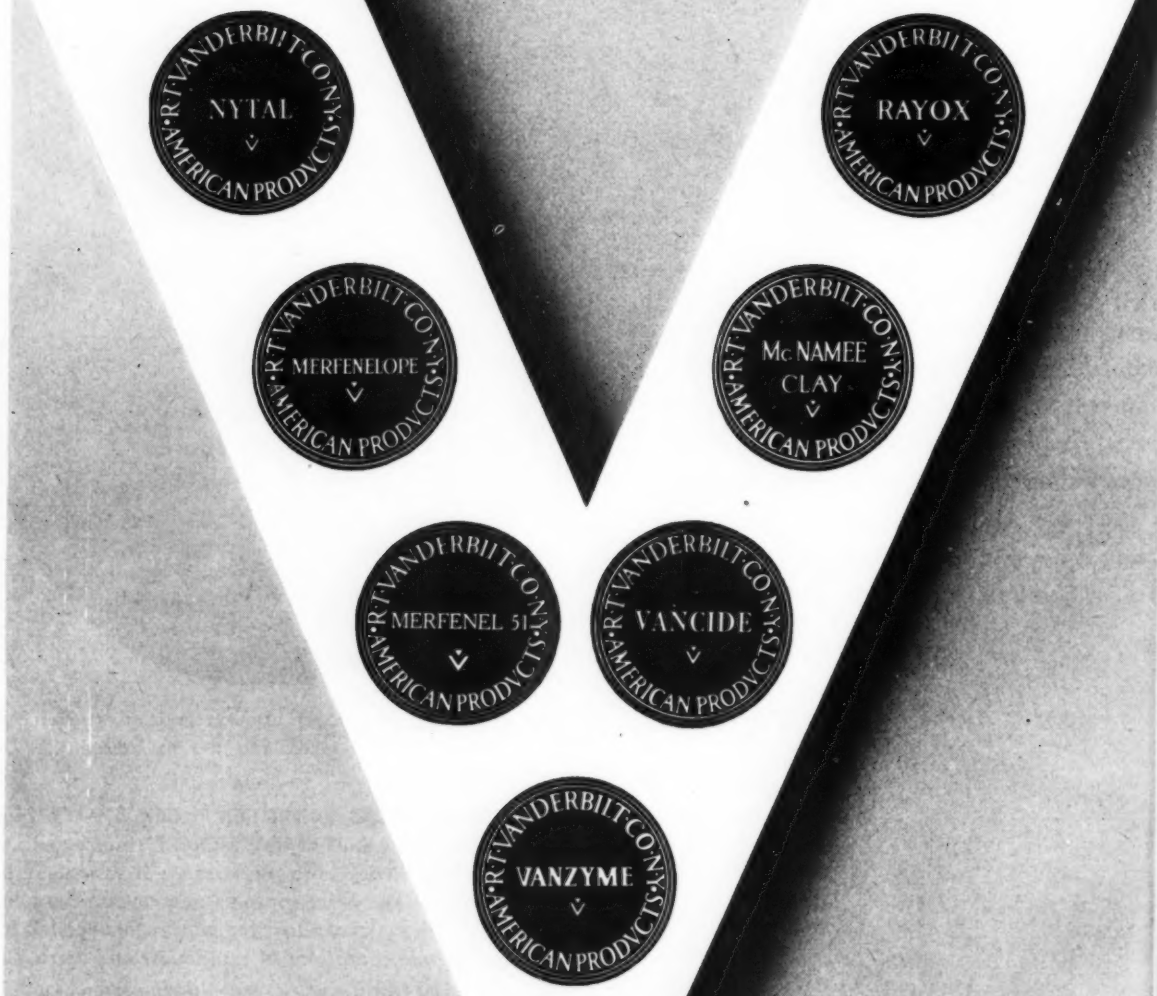
Jenkins Bronze Gate folder shows the many types available — lists convincing reasons why they are your best buy for any service. Ask for Form 181-A.

JENKINS VALVES

LOOK FOR THE DIAMOND MARK

SOLD THROUGH LEADING INDUSTRIAL DISTRIBUTORS

Products for the paper industry



R. T. VANDERBILT CO. INC.

230 Park Avenue, New York 17, N. Y.

The Paper Industry

October, 1952

To What Extent Encourage Foreign Expansion?

The recovery of the European pulp and paper industry—as reported elsewhere in this issue—has not resulted in any curtailment of operations of the American pulp and paper industry nor in a loss of any European markets to our industry, as was feared in some quarters.

Statistics show quite the opposite. American exports of paper and paper products reached record heights in 1951 and are continuing to increase, despite the fact that production of the European pulp and paper industry has surpassed its prewar output level.

It is the old story of a synchronous relationship which exists between highly industrialized countries. While there is the inevitable competition, there is at the same time a greater buying power, a vastly extended market capable of absorbing an ever increasing volume of goods, and new uses are discovered for new and old products.

A synchronous relationship—with benefits outweighing the disadvantages of competition for both participants — is, however, not guaranteed with every attempt at assisting and reconstructing a crippled foreign industry.

It is doubtful, for instance, whether our pulp and paper industry will be benefited by giving a foreign country access to our dwindling resources of softwood fibrous materials, which are already being depleted at a rate 1.5 times the new forest growth.

Our only remaining two major new sources of high quality softwood pulps are the forests of the Rocky Mountains and Alaska. Should the negotiations—now under way between the State Department and Japan—result in an agreement that would permit Japanese interests to exploit the Tongass Forest in Alaska, the depletion of our softwood fibrous materials might easily be accelerated to a point where the development of hardwood pulp utilization processes—as rapid as it is progressing—may not keep pace with the disappearance of our softwood forests.

Softwood pulps still are our preferred fibrous materials and they constitute 86 per cent of all new wood fiber used in paper and paperboard manufacturing. Softwood pulps are likely to remain for many years at a high premium, despite the ever-growing know-how of hardwood pulp utilization and the high yields and improved quality of hardwood pulps obtainable from the newly developed semichemical pulping processes.

It is appreciated that there are other pertinent factors to be considered in these negotiations. The strongest argument advanced for opening our Alaskan forest resources to Japanese interests is the insurance this would give us of keeping Japan from turning to Russia who is now controlling the woodlands of Sakhalin Island and along the Manchurian coast, which formerly supplied the Japanese pulp and paper industry with its pulpwood requirements.

Should the exploitation of the Tongass Forest by Japanese interests be the decisive factor in retaining Japan's allegiance to the cause of free nations, then we must be prepared to pay this price. But let us be sure there is no other way of achieving the same end without sacrificing our Alaskan softwood resources.

A. W. J. DYCK

in the PULP and PAPER INDUSTRY it's HORTON Elevated Steel TANKS

for an INDEPENDENT and DEPENDABLE Water Supply

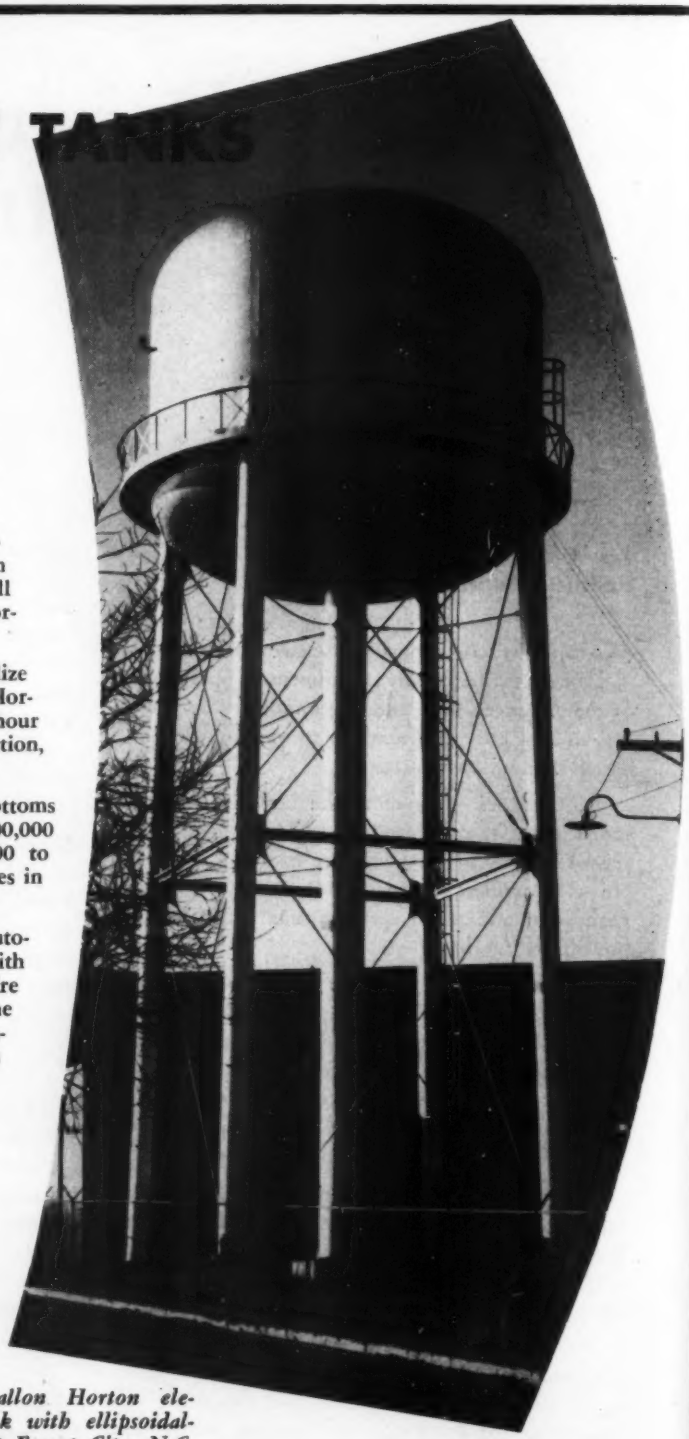
In the pulp and paper industry, as in many other industries, a dependable, uninterrupted water supply is of vital importance. The very nature of the processes involved demands that sufficient water be available at all times for production, general service, and twenty-four-hour-a-day fire protection. To assure their plants of an adequate operational and protective supply at all times, pulp and paper companies are installing Horton elevated storage tanks.

Welded steel Horton elevated storage tanks utilize dependable gravity pressure. Water stored in a Horton elevated tank is always ready—available any hour of the day or night for fire protection, production, general service.

Horton elevated water tanks with ellipsoidal-bottoms are built in standard capacities from 15,000 to 500,000 gallons—with radial-cone bottoms from 500,000 to 3,000,000 gallons—and with Horton Waterspheres in sizes from 25,000 to 250,000 gallons.

Horton tanks providing gravity pressure for automatic sprinkler systems are built in accordance with the specifications of the National Board of Fire Underwriters, the Inspection Department of the Associated Factory Mutual Fire Insurance Companies or the Factory Insurance Association, as required.

For more information or quotations on Horton elevated tanks and their use in your plant, write our nearest office without obligation. When requesting quotations please specify type of service, height to bottom, capacity, location, and kind of insurance carried if for sprinkler service.



100,000-gallon Horton elevated tank with ellipsoidal-bottom at Forest City, N.C.

CHICAGO BRIDGE & IRON COMPANY

Atlanta, 3 ..... 2143 Healey Building	Detroit, 26 ..... 1566 Lafayette Building	Salt Lake City, 4 ..... 527 West 17th South Street
Birmingham, 1 ..... 1511 North 50th Street	Houston, 2 ..... 2143 C & I Life Building	San Francisco, 4 ..... 1517—200 Bush Street
Boston, 10 ..... 1026-201 Devonshire Street	Los Angeles, 17 ..... 1559 General Petroleum Building	Seattle, 1 ..... 1327 Henry Building
Chicago, 4 ..... 2445 McCormick Building	New York, 6 ..... 3350—165 Broadway Building	Tulsa, 3 ..... 1651 Hunt Building
Cleveland, 15 ..... 2267 Guildhall Building	Philadelphia, 3 ..... 1653—1700 Walnut Street Building	Washington 6, D.C. ..... 1138 Cafritz Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, Limited, Fort Erie, Ont.

The Paper Industry Current Comment

Promising improvement . . . exports and imports . . . peat bogs

Despite threatening cross currents, the trend toward improvement in the paper market is continuing to a point where it is probable that the output for the last six months of this year will about equal the production in the same months of 1951. Demand is improving, and this applies to both the paper and the paperboard fields.

The disconcerting developments, however, involve a heavy slump in European prices, with heavy price cuts on Scandinavian paper for the United States market, and labor difficulties in some paper mills, including the Mead Corp. plant at Chillicothe, Ohio, and West Virginia's mills at Covington, Williamsburg and Luke.

As yet, domestic mills are not allowing the low prices of Scandinavian papers to weaken the domestic price structure. Earlier in the year the lack of demand caused a radical drop in the Scandinavian home market prices for pulp, and beginning with June this lower pricing for pulp began to have its repercussion in the paper field. Prices of Scandinavian kraft had dropped nearly 30 per cent, with an effort by the European mills to build up their output by low priced quotations for the American market.

On the optimistic side of the picture, however, there is every evidence of a healthy upturn. The biggest advance is in the paperboard field, where despite an increase in August to 89 per cent of capacity, an 18 per cent jump, the backlog of orders has risen to the highest figure since the middle of 1951. This increase is a reflection of the improvement in the demand for such consumer goods as textiles and shoes, and other commodities which need containers for shipment.

Another indication of trends is the increasing demand for casein. As a result of protests by domestic mills, especially in the coated book paper field, the Washington authorities are considering a request for the increasing of the quota for imported casein, which can, even with the present duty, be purchased at materially less than the domestic production prices. The quota for 1952 is 25 per cent lower than that for 1951.

Cargo charges

Hearings have been held at Washington on the question of the higher differential charged for pulp cargoes delivered at New York. The Scandinavian steamship companies have told the Federal Maritime Board that the difficulties of unloading pulp at New York are greater than at other ports, thus justifying the higher charge. On the other hand, the New York Port Authority insists that conditions at New York do not justify such an excess charge. The New York charge is $1 per ton higher than at other ports such as Philadelphia, and the charge at the Port of Newark is 50 cents above outlying ports. These charges must be met by the pulp purchasers, and the outcome has been the loss of much of the shipping normally coming to the New York harbor to such ports as Philadelphia, Baltimore and Norfolk. The federal board has given the two parties time to file supplemental briefs before reaching a decision.

Whether or not it can be considered another instance of "creeping socialism," the Defense Production Administration has considered asking Congress for legislation to permit the government to erect stand-by plants to manufacture various key items in the event of a stepping-up of defense production.

Trade agreements

The government has concluded a revision of the reciprocal trade agreement with Venezuela and has emphasized its so-called success in securing a continuance of the present tariff rates on writing and greaseproof and grease-resistant papers, but did not give such enthusiastic announcement of the authorization given Venezuela to increase its duty rate on toilet paper to four times the present rate. United States companies last year sold $400,000 worth of toilet paper to Venezuelan customers.

The President has asked the Public Advisory Board for Mutual Security to conduct, among other things, a survey of reciprocal trade agreements, with special reference to the expiration of the Reciprocal Trade Agreement Act in 1953, and implies a criticism of the efforts made by domestic industry to secure modifications of trade agreements which have resulted in damage to domestic industry. The underlying thought appears to be the seeking of arguments to authorize this government to continue to reduce its duty rates to encourage industrial production abroad.

There has been much talk of the "dollar gap" between the value of United States exports and its imports, the export totals being well in excess of the dollar value of imports. In this discussion no one seems to have given consideration to the tonnage volume involved in this situation at a time when American high wages have so raised the cost of its product that export sales become more and more difficult. The higher domestic production costs rise, the greater the difficulty in selling abroad.

New raw materials

The search for new papermaking materials continues. The latest is a request by a Swedish company for the cooperation of the Irish Peat Board in prospecting for peat bogs in Ireland for use in the production of insulation board if the bogs are found to be sufficiently rich. The proposal includes partial financing of the enterprise by Irish capital.

The University of Florida is asking a $100,000 appropriation for a pulp research laboratory, especially for the use of scrub oak for the making of new kinds of paper, rayon and plastics.

Financial reports

The August-September slump in the stock markets had its counterpart in the security field for paper mill issues, many of which dropped materially as compared with prices in the early summer.

Net incomes

American Writing Paper Corp.—Net income for six months ended June 30 was $119,035, compared with $351,483 for the same period last year.

A. P. W. Products Co.—Net income for six months ended June 30 was $26,-

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Insolubles (in water)	1.0% max.	1.0% max.
Volatiles	5.0% max.	5.0% max.
Ash	2.0% max.	2.0% max.
pH	6 - 8	6 - 8
Viscosity (4% in water)	20 - 30 cps	35 - 50 cps
Gel characteristics	Non-Gel	Non-Gel
Color	White	White

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240, as compared with $114,267 in the first half of 1951.

Atlanta Paper Co.—Net profit for SIX months to June 28 was $363,734.

Bathurst Power & Paper Co.—Net profit for the six months ended June 30 was $1,028,383, compared with $1,518,313 a year ago.

Celanese Corp. of America—Net income for six months ended June 30 was $1,159,896, compared with $17,967,886 for the first half year in 1951.

Celotex Corp.—Net income for nine months ended July 31 was $478,025, as compared with $2,680,989 for the same period in 1951; (the drop was caused largely by curtailment of operations due to a 10-week strike at the main plant, in addition to labor troubles in other areas).

Certain-teed Products Corp.—Net income for the first half year was $1,626,225, as compared with $2,554,431 a year ago.

Champion Paper & Fibre Co.—Net income for three months ended June 30 was $2,384,167, as compared with $2,549,830 for the same quarter in 1951.

Consolidated Paper Corp. Ltd.—Net income for six months ended June 30 was $5,417,072, compared with $5,926,087 for the first half of 1951.

Continental Can Co.—Net profit for the quarter ended June 30 was $2,854,932, compared with $3,446,885 for the like period last year.

Continental Diamond Fibre Co.—Net income for six months ended June 30 was $378,522, as compared with $612,074 in the same period of 1951.

Cornell Paperboard Products—Six months net income was $745,086, as compared with $1,027,600 for the first half of 1951.

Crown Zellerbach Corp.—Net income for three months ended July 31 was $5,150,000, as compared with $5,994,876 in the same fiscal quarter of 1951.

Denison Mfg. Co.—Net profit for the first half year was $690,000, as compared with $1,034,000 for the same period a year ago.

Dixie Cup Co.—Net profit for six months was $1,143,544, compared with $1,483,352 for the same period last year.

Eastern Corp.—Net income for the first half of the year was $594,229, as compared with $998,238 a year ago.

Flintkote Co.—Net profit for the 28 weeks ended July 12 was $2,009,375, as compared to $3,139,602 for the same period in 1951.

Fraser Companies Ltd.—Net income for the first six months was $2,478,625, compared with $3,067,844 in the first half of last year.

Gair (Robert) Co. Inc.—Net profit for the first six months of 1952 was $2,807,125.

Great Lakes Paper Co. Ltd.—Net

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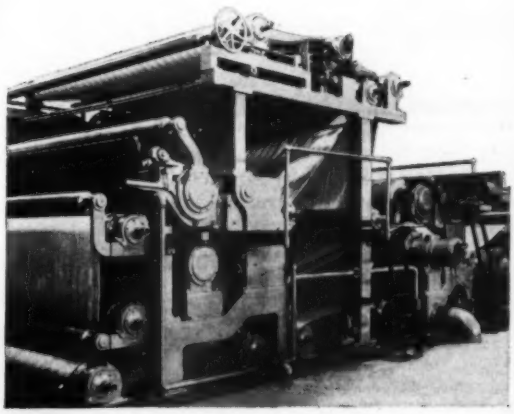

RB 10-52

profit for the first half of the year was $1,429,077, a decrease of $660,441 from the same period last year.

Great Northern Paper Co.—Net profit for the six months ending June 30 was $2,344,318, as compared to $2,596,689 last year.

Hammermill Paper Co.—Net income for six moths ended June 30 was $698,372, as compared to $929,212 in 1951.

Hinde & Dauch Paper Co.—Net income for six months to June 30 was $1,533,351, as compared to $2,326,152 a year ago.

Hollingsworth & Whitney Co.—Net income for 26 weeks ended June 29 was $1,489,108, compared to $1,930,293 for the comparable period in 1951.

Howard Smith Paper Mills Ltd.—Estimated consolidated net profit for the six months ended June 30 was $1,334,135, down from $2,839,245 a year ago.

International Paper Co.—Net income for the first six months of 1952 was $24,369,677, compared to $28,727,056 for the first half of 1951.

Keyes Fibre Co.—Six months profits in 1952 were $481,471, as compared with $771,580 last year.

Lily-Tulip Cup Corp.—Net income in the six months ended June 30 was $1,285,488, compared to $1,862,978 the year before.

Minnesota & Ontario Paper Co.—Net earnings after taxes in the first six months were $2,549,318 as compared to $2,681,500 last year.

National Vulcanized Fibre Co.—Net income for the six months ended June 30 was $342,878, compared to $1,003,099 last year.

Nekoosa-Edwards Paper Co.—Net income for the first six months was $925,000, compared with $1,035,000 for the same months of 1951.

Oswego Falls Corp.—Net income for the first six months of 1952 was $561,770, compared with $798,513 last year.

Oxford Paper Co.—Net income for six months ended June 30 was $1,326,041, compared with $1,299,548 for the comparable six months in 1951.

Puget Sound Pulp & Timber Co.—Net income for the first half of the year was $1,413,820, compared with $2,315,679 for the same months of 1951.

Rayonier Inc.—Net income for six months ended June 30 was $5,679,267, as against $5,907,902 for the same period last year.

St. Lawrence Corp. Ltd.—Net income for the six months ending June 30 was $3,112,958, as compared to $3,977,786 for the like period in 1951.

Scott Paper Co.—Net income for the first six months was $4,916,288, as against $5,544,038 in the same months of 1951.

Sonoco Products Co.—Net income for the first six months was $603,960.

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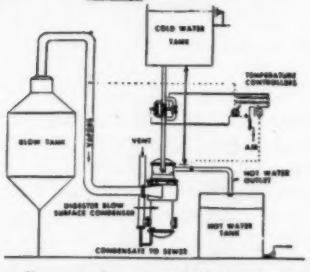

Flow diagram shows general arrangement of Blow Condenser System

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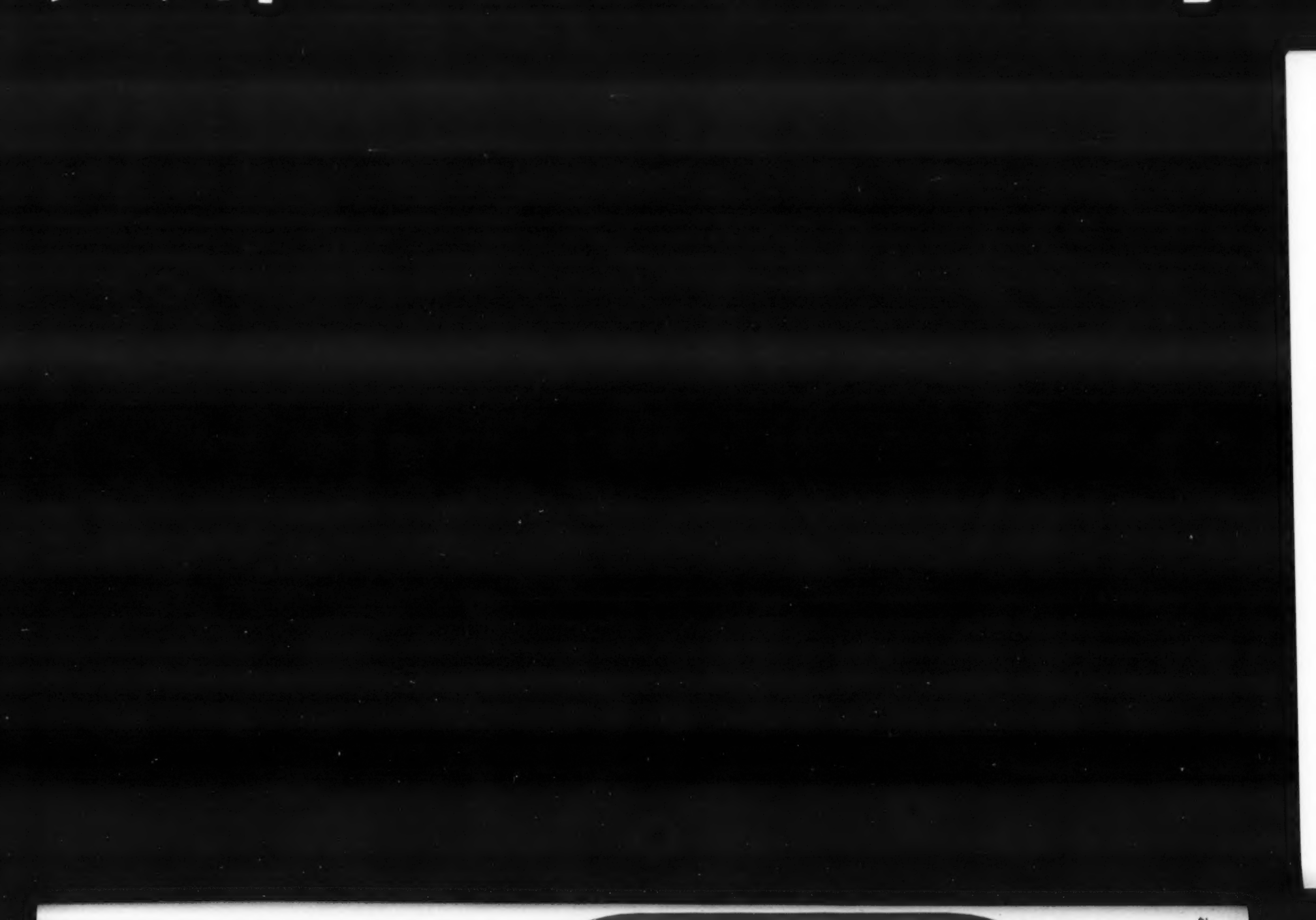

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Ketchikan Pulp & Paper Company
Ketchikan, Alaska

Longview Fibre Company
Longview, Washington

H. R. MacMillan Export Co., Ltd.
Nanaimo, Vancouver, B. C.

A/B Oulu, O/Y
Finland

St. Helens Pulp & Paper Co.
St. Helens, Oregon

St. Joe Paper Co.
Port St. Joe, Florida

Southern Kraft Division
International Paper Corporation
Natchez, Mississippi

Thilmany Pulp & Paper Company
Kaukauna, Wisconsin

Union Bag & Paper Company
Savannah, Georgia

United Paper Mills, Ltd.
Finland

Weyerhauser Timber Company
Everett, Washington

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Sorg Paper Co.—Net income for the first six months was $14,383, compared with $375,352 last year.

Southern Advance Bag & Paper Co.—Net income for 26 weeks ended June 28 was $1,337,543, compared with $1,629,907 last year.

Stone Container Corp.—Net income for the first half of the year was $738,713, as compared with $1,067,959 for the same period in 1951.

Sutherland Paper Co.—Net six months income was $1,195,105, as against $1,653,893 a year ago.

Union Bag & Paper Corp.—Net income for the first half of the year was $5,028,637, as compared with $6,498,079 a year ago.

United States Gypsum Co.—Net profit for the first six months was $9,600,175, compared to $10,539,510 a year ago.

Weyerhaeuser Timber Co.—Net profit after taxes for the six months ended June 30 was $19,287,624, as against $22,463,559 last year.

Whitaker Paper Co.—Net profit after taxes for the first half year was $351,047, compared to $467,914 a year ago.

Dividend Declarations

American Box Board Co. has declared a dividend of 37½ cents a common share, payable July 10 to record of June 27.

Champion Paper & Fibre Co. has declared the regular dividend of $1.12½ a share on preferred stock, payable October 1 to stockholders of record September 11, and a dividend of 37½ cents a share on the common, payable September 1 to holders of record August 8.

Eastern Corp. has declared a cash dividend of 25 cents per share of common stock payable September 2 to record August 15.

Fibreboard Products, Inc. has declared a regular quarterly dividend of $1.50 a share on the prior-preferred stock, payable August 1 to stockholders of record July 16.

Hudson Pulp & Paper Corp. has declared the quarterly dividend of 31½ cents on the Class A common stock; 31¼ cents on the 5 per cent preferred, Series A, $25 par, and 32 cents on the 5.12 per cent preferred, Series B, $25 par, all payable September 2 to holders of record August 15.

International Paper Co. has declared the regular quarterly dividends of $1 per share on the cumulative $4 preferred stock and 75 cents on the common, both payable September 22 to holders of record August 22.

Marathon Corp. has declared regular quarterly dividends of 30 cents per share on the common and $1.25 on the preferred.

Mead Corp. has declared a dividend of 40 cents a share on common stock and the regular quarterly distribution of $1.06¼ on the 4¼ per cent cumulative preferred stock, both payable September 1 to holders of record August 5.

The Minnesota & Ontario Paper Co. has announced the declaration of a quarterly dividend of 50 cents a share, payable July 25 to stockholders of June 30.

National Container Corp. has declared dividends of 25 cents per share on the common and 31¼ cents on the $1.25 convertible preferred, $25 par value, both payable September 10 to record of August 20.

Nekoosa-Edwards Paper Co. has declared a 40-cent dividend per share, payable September 10 to holders of record August 29.

Northern Paper Co. has declared a regular dividend of $1 a share on the common and a dividend of $1.50 on the 6 per cent preferred, second issue, both payable September 10 to record of August 20.

Puget Sound Pulp & Timber Co. has declared a quarterly dividend of 50 cents a common share, payable September 30 to record of September 12.

River Raisin Paper Co. has declared a dividend of 20 cents a common share, payable September 19 to record of September 4.

Southern Advance Bag & Paper Co. has declared an extra dividend of 12½ cents and a regular quarterly dividend of 25 cents per common share, both payable September 30 to stock of record September 12.

Union Bag & Paper Co. has declared a quarterly dividend of 75 cents, payable June 13 to stockholders of record June 6.

Whitaker Paper Co. has declared a dividend of 25 cents a share on the common stock, payable October 1 to holders of record September 12.

Paper mill corporate changes

Champion Paper & Fibre Co. expects to place $5,000,000 in 20-year 3⅜ per cent debentures with private financial interests.

Consolidated Paper Co. has announced that Shader-Winckler Co., members of the Detroit Stock Exchange, have completed a secondary distribution of 1,200 shares of stock at $25.75 per share.

Gair (Robert) Co. will simplify its capital structure by the retirement of all of the outstanding preferred stock and that of its wholly owned subsidiaries. The new capital structure will consist of $20,000,000 in promissory notes held by institutional investors and 2,179,888 shares of common stock.

Gaylord Container Corp. earmarked $3,000,000 for its expansion program when it sold 3⅜ per cent promissory notes for that amount to Equitable Life Assurance Society.

Green Bay Tissue Mills is the name of a newly formed corporation for the merchandising of products made at Shawano, Wis., and other manufacturing facilties yet to be announced. Paul L. Lewis, president of the new firm, is president of Little Rapids Pulp Co., as well as of Shawano Paper Mills.

Hinde & Dauch Paper Co. has announced that a secondary offering of 10,000 common shares is being made by Fulton, Reid & Co. of Cleveland at 20⅝ a share, with a selling commission of 70 cents.

Howard Smith Paper Mills Ltd. has made an offer of 1¼ shares of its common stock for each common share of Donnacona Paper Co. Ltd. The offer expires November 28 and does not apply to U.S. residents.

Hudson Pulp & Paper Co. has received another $2,000,000 loan from Equitable Life Assurance Society for construction purposes. Hudson will repay the new money from 1955 through 1966, with interest at 3¾ per cent.

Penobscot Chemical Fibre Co. has arranged for a first mortgage bond issue of $1,250,000 for additions and improvements on its existing plant. The bonds will be offered the public through a Boston financial group.

New York Stock Exchange—Stocks

Closing Prices

	Sept. 19, 1952	Aug. 20, 1952
A.P.W. Products	4⅞	4⅞
Celotex	17¼	17¼
Same Preferred	16¼	* 16¾–17
Certain-teed Products	14½	14⅝
Champion P & F Co.	27¼	17¼
Same Preferred	103⅝	101⅝
Chesapeake Corp.	30⅝	* 33–33½
Continental Diamond	11⅝	12⅝
Container Corp.	35⅝	37¼
Same Preferred	100½	100½
Crown Zellerbach	55⅝	58¼
Same Preferred	102½	102½
Dixie Cup	32¼	* 34⅝–35½
Eastern Corp.	17½	* 18⅝–19
Robert Gair	16⅝	16⅝
Same Preferred		19⅝
Gaylord Container	27⅞	30⅝
International Paper	49⅞	49½
Same Preferred	102	*100¾–101⅝
Kimberly-Clark	47⅝	48⅝
MacAndrews & Forbes	41	* 40¼–41
Marathon	24⅝	25⅝
Masonite	24½	25⅝
Mead Corp.	24½	24½
Same Preferred	86¼	* 86¼–87½
National Container	10⅝	11½
Rayonier, Inc.	33¼	33
Same Preferred	35⅝	35¼
Scott Paper	52⅜	52½
Same 3.40 Preferred	90½	* 92–93
Same $4 Preferred	105	*103½–105
St. Regis	19	19⅝
Same Preferred	93	* 93–94
Sutherland Paper	25⅞	25⅞
Same Preferred	106¼	*107½–109
Union Bag & Paper	47⅛	47⅝
United Board & Carton	13⅞	* 14⅛–14⅝
United Wall Paper	2⅞	2⅞
Same Preferred	24¼	* 24¼–25½
U.S. Gypsum	115½	116½
Same Preferred	174¼	*175½–177
West Virginia P. & P. Co.	77	* 80½–81
Same Preferred	108	*107½–109

New York Stock Exchange—Bonds

Celotex 3½%	99¼	99¼
Champion P. & F. Co. 3¾	—	—
Mead Corp. 3¾	—	—

New York Curb Exchange—Stocks

Am. Writing	9½	9¾
Brown Co.	9⅞	10½
Brown Co. $5 Preferred	103	105½
Same Preferred $3	49	50½
Great Northern Paper	52	54
Hammermill		17¼
Puget Sound	28½	30

* Closing Bid and Asked Prices

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This unretouched photograph shows a 1% solution of KELSIZE twenty minutes after being puddled on blotter. Note how solution remains on surface of blotter. This test illustrates that KELSIZE is an excellent material for controlling penetration and strike through of aqueous solutions, thus increasing the efficiency of adhesive or surface sizing solutions by retaining them at the area of application.

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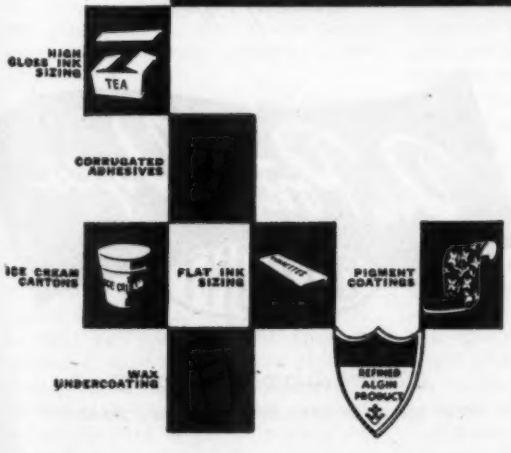

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High Dollar and Low Demand Strike Canadian Earnings

CONDITIONS ARE "RUGGED" in the Canadian pulp and paper industry, now faced with rapid changes in market conditions for its products in the first half of this year. The result during that period was an average drop of 16 per cent in profits, according to a Toronto *Telegram* study of semi-annual reports thus far reported.

New factors have crept in to depress earnings, though the industry was again faced with rising costs of operation. For the first half of 1951 earnings were generally higher, notwithstanding increasing income taxes and costs. This increase resulted from heavy demand for pulp and other products, such as printing papers, kraft papers and hardboard, and the rising world prices for the pulps.

Dollar at a premium

Newsprint production, "because of a politically-depressed price and rising costs," failed to support its earnings. In the first half of 1952 this major Canadian industry received another sledge hammer blow. Demand for pulp and other allied products slumped throughout the world, reflecting a recession in business.

At the same time, the Canadian dollar was rising to a premium over the U.S. dollar. This advance might be cheered by many Canadians, but not the pulp and paper industry. For it was faced with a forced decline in income from exports.

In the first half of 1951 the Canadian dollar averaged out to about 95 cents in U.S. funds. In the first half of this year, however, the average price was $1.02. The effect of this 7-cent rise in the dollar is noticed. Approximately 86 per cent of the dominion's newsprint output is exported to the U.S. In the first six months of last year this tonnage totaled 2,383,714 and in the first half of this year 2,388,565. The price of newsprint early in 1951 was $106 in New York, N.Y., equivalent to approximately $112 Canadian. This was increased to $116 a ton at midyear or about $123 Canadian.

Six-Month Income Record of Selected Canadian Firms

Company	Net Income 1952	Net Income 1951	% Change
Abitibi	$ 4,404,055	$ 5,441,158	—17
Consolidated	5,417,072	5,926,087	—9
Donohue	296,533	428,160	—31
Fraser	2,478,626	3,067,844	—18
International	24,369,677	28,727,056	—15
Mando	2,549,318	2,681,500	—6
Powell	3,650,933	4,245,914	—14
St. Lawrence	3,112,958	3,977,786	—17

In the meantime, however, the Canadian dollar climbed. As one industry executive has noted, where his firm received $123 Canadian on July 1, 1951, by the spring of this year it was receiving only $112 per ton for its newsprint. This June newsprint was boosted $10 a ton in export price to $126 at New York, equivalent to approximately $122 Canadian. The newsprint industry was back to the July 1951 price level, without, however, taking into account higher freight rates, labor, and operating costs. In commenting on the latest price boost, a newsprint executive pointed out that considering higher freight costs, the June price would cover only about half of the income decline per ton during that period.

Pulp not seriously affected

Pulp has not been so seriously affected by changes in the Canadian dollar, since only 988,235 tons were exported in the first six months of 1952, compared with 1,082,305 tons in the same period last year. Selling prices, however, recently fell. Bleached sulphite was cut from about $167 a ton to $150, and unbleached sulphite was reduced from $160 to $140 per ton.

Although the first half of 1952 was considered unsatisfactory for the pulp and paper industry, some improvement in earnings is expected in the final half, according to the *Telegram*, which reports that the industry has come through a period of considerable change in business conditions that now appears to be leveling out. Brokers say that the benefits of the newsprint increase will become more apparent.

Experts expect a moderate overall decline in net profits for the full year and feel that the pulp and paper industry has now reached a firm base of operations. For many years the long-term trend has been upwards and is expected to climb even higher despite fluctuations in the general economy.

Higher sales, lower profits

Minnesota & Ontario Paper Co., a diversified firm, possibly typifies the effects of changes in operating conditions on earnings. Notwithstanding an increase in sales of $1,000,000, this company had a drop of 6 per cent in net profits during the first half of 1952. J. B. Faegre, Mando president, has declared that demand for newsprint is in close balance with supply, while demand for other papers is erratic, influenced by excessive customer inventories.

The largest newsprint producer on the West Coast, Powell River Co., suffered a sharper drop against increased sales. Strong demand and capacity sales are anticipated in newsprint by the firm. Price for unbleached sulphite, however, has dropped in the third quarter of 1952, and production will have to be curtailed.

Aubrey Crabtree, president of Fraser Companies, which does not produce newsprint, reported some operations have been cut down, and the backlog of orders on hand at the start of the year has disappeared.

Abitibi Power & Paper, a firm largely dependent on newsprint production,

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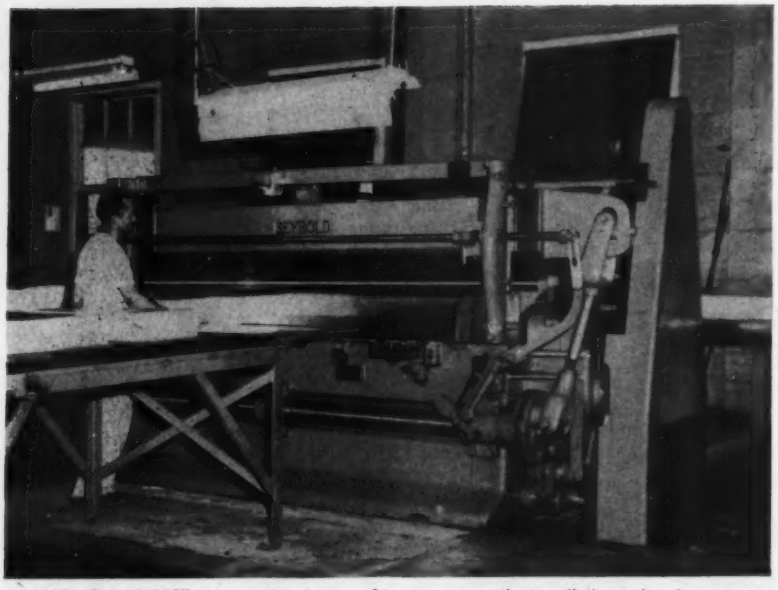


CANADA'S LARGEST paper trimming machine was recently installed at the Georgetown mill of Provincial Paper Ltd. The 94-inch Seybold is equipped with an air film table to facilitate the handling of stock. Two conveyor tables are used—one for loading from the back and the other for unloading from the front. The cutter knife is changed every eight hours to maintain sharp trimming quality. The installation represents another step in Provincial's multi-million dollar improvement and modernization program

reports that the decline in earnings was primarily due to the drop in the value of the U.S. dollar and increased production costs as a result of higher labor costs.

Newsprint mills are operating at capacity. Production, however, of pulp and board is reduced.

Consolidated Paper, a major newsprint maker, has reported that newsprint demand continues strong, whereas world-wide demand for pulp has weakende. Donohue Bros., producers of both newsprint and mechanical pulp, blames higher costs, reduced demand for groundwood pulp, and the rise of the Canadian dollar.

Forecast Increased U. S. Demand for Canadian Pulp and Paper

This fall may see an increase in the U.S. demand for Canadian pulp and paper due primarily to the upswing in industries consuming paper. As indicated some time ago, the substantial decline in sales of paper (other than newsprint) and in paperboard, containers, etc., in the U.S. for recent months finally forced considerable price cuts in Canadian pulp export prices for the third quarter of 1952, with two price recessions by Scandinavian pulp mills as a secondary factor.

In 1949 there were reductions in pulp prices in the second and third quarters to far lower levels than prevail in today's third quarter prices. In the final quarter of 1949 there was a substantial improvement in demand for pulps by U.S. consumers, following earlier inventory adjustments, and sales of Canadian pulps rose sharply.

This condition continued though the first half of 1950. Then followed, partly as an outcome of the general rush to buy at the outbreak of the Korean War, advances in the pulp prices for the third quarter of that year, with another in the fourth and two more in the first and second quarters of 1951—to much higher levels than had ever been reached before.

At this time, a fairly encouraging report from New York, N.Y., indicates that the paper and board mills, about to start on their "new production year" (for fall and Christmas buying), are optimistic about future demand. There is reported to be a "pickup in wood pulp bookings for the third quarter and a general clean-up of excessive inventory positions both in primary and secondary industries."

Canada Leading Exporter of Wood Pulp

Canada is the world's leading exporter of wood pulp, accounting for one-quarter of global production and one-third of all international trade, according to a booklet, "Canadian Wood Pulp Data 1952," issued in Montreal September 16 by the CPPA.

About three quarters of the pulp produced in Canada is used by Canadian mills. Domestic usage has more than doubled since 1929. While much of it is made into newsprint, book and writing, and other cultural papers, more and more is being employed in the manufacture of pulp for sale and of paper for industrial use, such as wrapping, building, roofing, and paperboards. Today, for every pound of paper used in Canada for culture, more than 2¼ pounds are consumed for industrial purposes. This trend toward greater diversification in the use of pulp is likely to continue, according to CPPA, and will likely make ever-increasing demands on Canada's wood pulp industry.

Canada is the world's leading exporter of pulp. In value, pulp exports rank fourth among all Canadian exports. More than 80 per cent go to the United States; at the same time, Canada is the major source of pulp imported by the U.S. and accounts for about 80 per cent of the U.S. imports.

The dominion's second largest pulp market is the United Kingdom, which takes about 10 per cent of exports; another 10 per cent moves to other countries overseas.

Over the last 25 years, world wood pulp production has more than doubled. Today, Canada and the U.S. produce nearly 70 per cent of the world's pulp. The majority of the world exports come from Canada and Scandinavia. They supplied 94 per cent of all pulp exported last year.

The 32-page booklet points out that wood pulp is a prime requisite of civilization, a raw material essential to modern man. It highlights the importance of the forests and the pulp and paper industry to Canadians. In addition to its survey of Canadian pulp production, consumption and exports, and the U.S. market, it briefly reviews world pulp markets. Accompanying the descriptive text are several charts and tables giving graphic presentation of the facts.

British Columbia Pulp Mill Output Slashed

Announcement came on September 11 that British Columbia pulp mills are cutting production in two lines by up to 20 per cent. The reason given was a world slump in price and demand. The cutbacks came in the production of sulphate and sulphite pulps.

A spokesman for B. C.'s No. 1 industry declared that West Coast production had shot far ahead of demand, and "we have large stocks around the world that will have to be worked off before full production is resumed."

He said exports to the U.S.—the No. 1 buyer—were cut when Scandinavian producers reduced prices drastically in a bid for the American market. The spokesman declared that the newsprint industry is not affected as world demand remains bouyant.

At the same time, B. C. pulp and paper mills faced the possibility of a reduction in purchasing by Great Britain. This was apparent following the announcement in London of "probable cuts in pulp and paper buying." Great Britain is one of B. C.'s best customers for kraft pulp and buys a variety of other pulps and papers. Sales to Great Britain yearly approximate close to $11,000,000.

Operators hesitated to take a gloomy view of the picture but agreed that the news was "unfavorable." Reduced buying would weaken the already lowered prices of pulp of all kinds. The blow would be felt principally by mills in Port Alberni, Namaimo, and Port Mellon, chief producers of kraft pulp, which is manufactured by the British into wrapping papers and packaging.

Pulp and paper exports to the United Kingdom in 1951, according to the bureau of economics and statistics of the Department of Trade and Industry, were as follows: bleached kraft sulphate pulp, $2,548,673; unbleached kraft sulphate pulp, $6,390,094; dissolving sulphate pulp, $834,207; strong unbleached sulphate pulp, $593,320; news grade unbleached sulphate, $251,557, and kraft wrapping paper, $323,227.

80-Year Growth of Canadian Industry Praised by CPPA

Today Canada's pulp and paper industry is one of the world's major enterprises. Acording to a recent CPPA brochure, "From Watershed to Watermark," as a producer of newsprint its output is five times that of any other country. As a producer of pulp Canada is the second largest manufacturer, and also the greatest exporter, furnishing about one-third of the world's exports. More than 70 per cent of the industry's total output, now running at approximately 9.6 million tons of pulp and paper, moves abroad. In value, the remainder constitutes one of the leading elements in the entire domestic trade of Canada.

Growth of Canada's Pulp and Paper Industry Over Eight Decades

Year	No. of Mills	Total Employes	Total Production
1871	21	760	$ 1,071,651
1881	41	1,588	2,509,993
1891	58	2,817	3,633,257
1901	53	6,236	8,627,557
1911	72	9,766	23,226,479
1921	100	24,619	151,003,165
1931	103	26,669	174,733,954
1941	106	37,154	334,726,175
1951 (est.)	130	55,000	1,200,000,000

New B. C. Mill Goes into Production

The first pulp and paper mill built in British Columbia in 35 years was opened in Duncan Bay September 15. The mill, first unit of a $40,000,000 development planned by Elk Falls Co. Ltd., went from blueprint to actual operation in less than two years. It is the first built in the province to handle salvage wood, small trees, etc., which previously had been allowed to go to waste.

Designed for a daily production of 320 tons of newsprint, the mill is almost a "push button operation," with a minimum of manual labor required. It was financed and built by Canadian Western Lumber Co. Ltd. and Pacific Mills Ltd.

Quebec Pulpwood Cut Expected to Drop

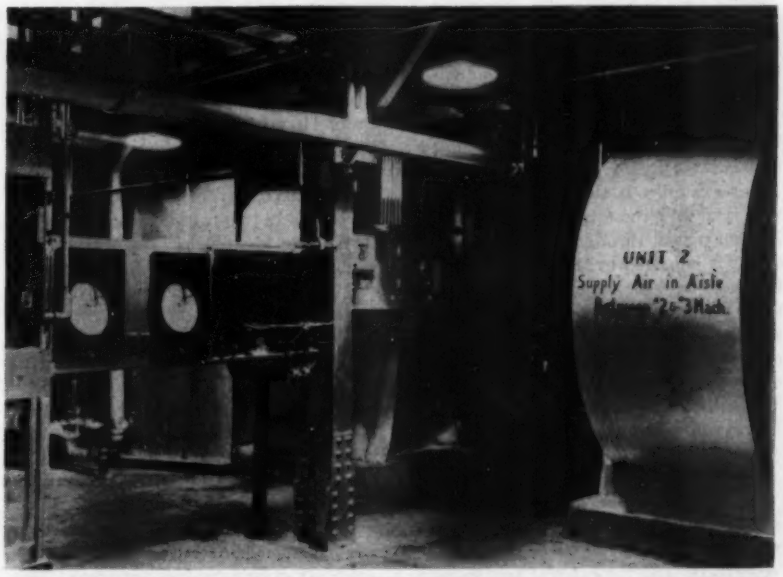
The pulpwood cut in Quebec Province this year is expected to drop 15 to 25 per cent from the 1951 record of more than 7,000,000 cords, according to a spokesman for the provincial Department of Lands and Forests.

Wood stocks in pulp mill yards are plentiful, and despite the fact that pulp mills are opearting at capacity, the plants cannot use up all of last year's production plus an estimated 1,500,000 cords left over from the 1950 cut.

Canadian Notes

Canadian National Railways has received authorization from a Senate committee to construct a 46-mile line from Terrace to Kitimat in British Columbia. The bill still must be passed by the Senate and given Royal assent. Cost of the addition to the line running from Edmonton to Prince Rupert will approximate $10,000,000. Aluminum Co. of Canada at Kitimat has guaranteed Canadian National against any loss on freight traffic during a 10-year period. It is believed that the Kitimat project will eventually include a pulp mill.

Canadian Paperboard Production in the first half of 1952 was 9 per cent below the similar period a year ago and 1 per cent under the 1950 level. According to an announcement by the Canadian Pulp and Paper Association, output of paperboard between January and July this year was 346,297 tons. Boxboard production was down 14 per cent, container grades were down 4 per cent.



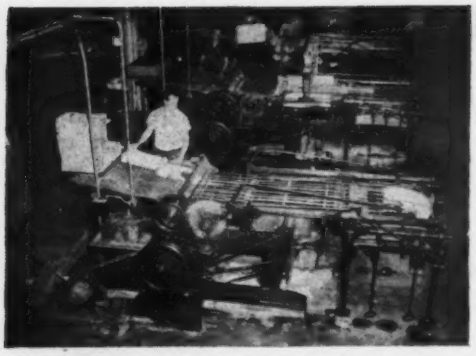
MECHANICAL BRAIN that controls the Briner economizers at Mando's International Falls mill; to the left are the temperature controls; to the right, the air intake fan, while the economizer unit is shown in the background

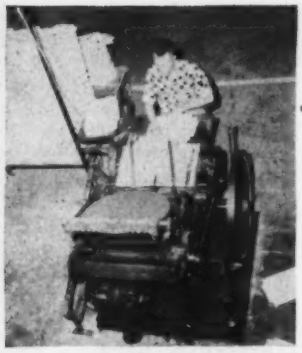
Mando Completes Installation of Briner Economizers

Substantial steam savings, amounting to several thousand dollars a month, and greatly improved working conditions resulted recently when Minnesota & Ontario Paper Co. completed the installation of Briner economizers on its three paper machines at International Falls, Minn. Clarence Larson, Mando vice president in charge of production, reported that the new heating and ventilating equipment would also result in more uniform and improved paper products.

After working more than a year on the modernization project, Mando maintenance crews and outside engineers completed the installation, which has been called a typical example of the modernizations and improvements that have been taking place at the company's mills at International Falls, Kenora, and Fort Frances. Since 1945 more than $29,000,000 has been expended for plant and facility modernization.

"We are making special efforts," Mr. Larson added, "to advance our facili-





BOXES FOR EVERYTHING from jewels to shoes are being manufactured in the new $1,000,000 plant of Gardner Board & Carton Co. at Lockland, Ohio; the largest plant of its type under one roof, the factory contains more than $2,000,000 worth of machinery, including pony printing presses (left) and job printing presses (right); the flexible trolley duct lighting system is one of the latest innovations in industrial lighting.

ties. These improvements have given us a high degree of product diversification, so that today our mills are capable of producing eight kinds of pulp, from which a variety of papers are made."

Steam savings

According to Mr. Larson, steam savings will result, as paper machine vapors are used to heat fresh outside air that is drawn into the economizer unit. The heated fresh air is then piped to all sections of the plant. Before, the plant was heated with steam from the mill's boilers.

For example, if the outside temperature is −30F., the fans draw in this cold air and pass it through the economizers, where it is heated to 69F., or a temperature rise of 99F. without utilizing heat from the central steam system. This has a special advantage in northern Minnesota and Ontario, a land of temperature extremes.

Also incorporated in the economizers is a water-heating unit. A fine spray of water is injected into the flow of warm air as it leaves the economizer section. The water is heated and later used for shower water and stock water. These spray chambers were placed beneath the economizer and the exhaust fan on each unit. The new economizers have a capacity to heat about 1,100 gallons of water per minute.

Construction

The Briner economizers consist of a series of corrugated sheets of stainless steel with alternated spaces for vapor and for fresh air. The fresh air enters a large intake in the wall of a penthouse-like structure that was built on the roof of the plant. Two such penthouses were constructed on top of the machine room roof; the four units for No. 4 machine are in one penthouse, and six units for Nos. 2 and 3 machines are house in a second penthouse.

The new installation replaces heating and ventilating equipment that was put into operation in 1936. The old equipment, a combination of wet and dry systems, had become obsolete and beyond economical repair. The waste heat was not being efficiently utilized to heat the building or to improve drying conditions.

With the installation of the new economizers, workmen have an automatically controlled heating and ventilating system. Manufactured by Minneapolis-Honeywell Regulator Co., each of the 10 units has a master thermostat and a sub-master thermostat. These thermostats control the differential between the outdoor and indoor temperatures. The instruments are operated by compressed air. The outside thermostat sets the sub-master one, which controls the inside temperature. When the paper machines are not operating an employee can easily, via an air-operated switch, shut off all air flowing into the plant.

The 10 units of the three paper machines are of stainless steel, and the total weight is 93,000 pounds. Each of the fans is about 9 feet 6 inches high and weighs nearly a ton.

Stacks extending from the hood over the paper machine can be raised or lowered via a telescoping operation. This allows cranes to pass between the machine and the hood.

As the fresh outside air enters the economizer, there is no mixture with the hot vapor-laden air from the paper machines. The fresh air enters coils, where it is heated, and then the fresh warm dry air is blown through ducts to the paper machine's dry ends and aisles, finishing room, groundwood screen room and machine room basement.

Quicker drying

The paper on the machine dries more quickly and uniformly as the paper comes in contact with the dry air. As the humidity on the machine room floor remains slight at all times, regardless of outside weather conditions, production increases, resulting in an improved product.

As the humidity was reduced and the temperature around the paper machine lowered, working conditions were improved. This eventually promotes greater job interest on the part of the machine operators, allowing them to fully utilize their skills.

The equipment was supplied by J. O. Ross Engineering Corp. The installation was made by Mando's maintenance crews, under the supervision of Ross and Mando engineers.

$100,000,000 Wood Pulp Mill Predicted for Juneau

North America's largest pulp plant has been predicted for the Juneau area of Alaska by B. Frank Heintzelman, regional forester. Mr. Heintzelman, who is credited with a key role in bringing Alaska's first pulp mill to the Ketchikan area, predicts a bigger one for Juneau within five years.

The proposition is still in the formative stage, but if it works out it will mean a possible investment of $100,000,000. In an interview, Mr. Heintzelman declared that, "for the past year and a half we have discussed the matter with certain newspaper publishers," adding that they have given thought to the matter and have interested other publishers in the idea of establishing a large corporation of newsprint users to build the plant.

"Ninety per cent of the (newsprint) supply used in the United States comes from Canada," the forester asserted. "Consumption of newsprint is mounting with the increase in population and the price is rising continually." He described timber supplies and power sites in the area as sufficient to last forever. Pulp production at the Ketchikan plant, now under construction, is not to be used for newsprint, but for industrial purposes.

Pacific Paperboard to Rebuild

The plant of Pacific Paperboard Co. at Longview, Wash., is to be rebuilt as soon as possible, according to an announcement by Everett Flood and Mrs. Florence Lynch, vice presidents and directors. Fire leveled the plant January 12.

An inventory of ruined and salvaged equipment was to be completed sometime this fall, with an application for an RFC loan to follow. The firm made application shortly after the blaze, but Mrs. Lynch explained that it was withdrawn when officials of the company found that the amount was more than would be needed.

Initial rebuilding efforts have been underway for some time. On the job has

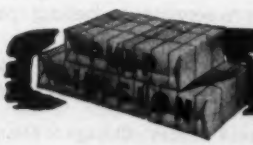
GROWING ASSURANCE

of a future supply of WEYERHAEUSER WOODPULP

As early as 1911, Weyerhaeuser Timber Company had plans to consolidate and hold large blocks of timber land for the growing of future timber crops. In 1924, the company employed experienced foresters to work out the details of these plans.

During the mid-thirties the development of a broad forestry policy proceeded at an increased pace. In 1941, the Clemons tree farm was established as the first of its kind. Thus began a nation-wide movement which recognized the fact that private owners of forest land could and must manage their lands for continuous production of forest crops according to sound forestry principles. Now, there are over 25,000,000 acres of such farms located in 35 different states.

Today, all of the Weyerhaeuser Timber Company's operating forest lands are divided into eleven tree farms containing over 2,500,000 acres of timber land. With a background of half a century in the timber business, Weyerhaeuser is now projecting its sustained yield forestry policy 100 years ahead! This is part of the company's *permanent production program* designed to provide a continuing and *increasing* timber supply for its mills.



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Heavy Duty • All Purpose
Clipper Seams if Desired

One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products. Here fabric thickness after weaving is being gauged.

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been a crew of 40 men, mostly supervisory personnel, who have been repairing tons of machinery seared in the fire. Mr. Flood reported that these workers are being kept on the job to make certain that that force is intact when production is resumed. "They were willing to gamble with us," he said, "and we will bend every effort to obtain financing." Useable materials were appraised earlier at $2,000,000.

Riegel Reports on Initial Operation of Wet-Bottom Precipitator at Acme

Initial operation on its first wet-bottom type electrostatic precipitator has been reported by Riegel Paper Corp. The unit was installed at the firm's Acme, N.C., pulp mill.

The wet-bottom design is a new development in precipitators for paper mill applications. Utilizing a circulating black liquor flow instead of dry dust hoppers and conveyors, a wet-bottom system enables rapid re-use of the collected dust. The new precipitator was developed by Research Corp., Bound Brook, N.J.

The new precipitator at Riegel's Acme mill removes sodium sulphate from gases from a spray-type recovery furnace handling 750,000 pounds of black liquor solids per day. On installation, the precipitator was designed to clean 112,000 cfm of gas at 280F. at a rated efficiency of 90 per cent, but operation reports show that actual recovery efficiency is 95 per cent.

With the new wet-bottom method of handling the collected dust, the bottom of the precipitator is employed as a liquor sump or tank through which the black liquor from the multiple effect evaporators flows and takes up the collected dust. Flowing continuously, the black liquor enters the wet-bottom, receives the collected dust, and is then drained to pumps that send the black liquor to cascade or disc evaporators.

Automatic controls maintain proper liquor flow and level. Motor-driven rotary agitators in the liquor facilitate solution or suspension of the dust. The wet-bottom arrangement, requires less plant space than the dry hopper system.

Expansion Notes

Marathon Corp.
has received approval from NPA for a $5,927,500 expansion allotment of materials at its pulp and paper operation at Oswego, N.Y. The allotment was made for the third quarter of this year.

Southern Paperboard Corp.
of Port Wentworth, Ga., an affiliate of Ft. Wayne Corrugated Paper Co., is embarking on a $5,000,000 expansion program. Plans call for increasing the capacity of the firm's mill to 625 tons of paperboard daily and installing reserve facilities against production loss in repair shutdowns. The additional capacity is scheduled for completion by late in 1953.

Coos Bay Pulp Corp.
at Anacortes, Wash., has completed a two-year modernization program, according to Jesse R. Lewis, production manager. A new method of making pulp through an ammonia chemical process will result in softer paper, he declared. In addition, a new pipeline has been constructed to carry mill wastes into deep water.

Inland Container Corp.,
Indianapolis, has announced the purchase of two corrugated box companies. The new Inland acquisitions are Ashtabula Corrugated Box Co., Ashtabula, Ohio, and Erie Corrugated Box Co., Erie, Pa. Inland has joint ownership with The Mead Corp. of Macon Kraft Co., Macon, Ga., and of another kraft mill now under construction at Rome, Ga.

Mengel Co.'s
corrugated box division has completed an annex to its plant at Louisville, Ky., and is installing a corrugator in the new building. The firm has recently put in new equipment for printing, die cutting, stitching and taping corrugated paper packing material. On completion of the present program, the plant's capacity will be doubled.

Horry Loggers Inc.
of Conway, S.C., has been granted a charter by the South Carolina secretary of state to engage in logging, clearing and land development, purchase and cutting of pulpwood, and to deal in lumber and wood products. The capital stock is $10,000. E. F. Dargan is president.

Annual Report of Kalamazoo Anti-Pollution Group Encouraging

FIRST-YEAR EXPERIMENTS in a research laboratory at Kalamazoo, Mich., hold out promise that it may be "technically possible and economically feasible" to utilize sludge from paper mill deinking wastes. According to the first annual report of Kalamazoo River Improvement Co., promising outlets for the sludge in original or modified form appear to include the paper industry itself, manufacturers of rubber goods and asphalt tile, and the building trades. The report was made by Dr. Alfred H. Nadelman, director of the pulp and paper technology course at Western Michigan College.

Since the beginning of the papermaking industry in the Kalamazoo Valley, the deinking mills have discharged their wastes into the river. In the beginning and for many years following, the river was sufficiently large to dispose of the limited quantity of city and industrial wastes without serious complaint. As the paper industry and the deinking of wastepaper continued to grow in the area, the load on the river became increasingly heavier. Presently the deinking mills are endeavoring to improve the condition of the river.

Three possible outlets

In conducting the experiments, the physical and chemical properties of the waste have been studied. From the findings of these experiments, it has been possible to select some fields in which the solids may be used. (The deinking waste is gray in color and is a mixture of various inorganic and organic substances. Its major constituent is clay mixed with small portions of carbon black, calcium carbonate, and debris from cellulose fiber.)

Many attempts have been made to separate the organic and inorganic materials. Incineration at fairly high temperatures has given the best results. The incineration product is a material of high white color. It may have a future use in the paper industry as a filling or coating pigment, or it may be used in other industries as a bright extender. To date, the incineration products have two weaknesses, namely: slight abrasiveness and relatively coarse particle size. Experimental work is now under way to overcome these undesirable factors.

Extensive work has been carried out in the field of building materials. Since there is a growing demand for lightweight aggregates used to produce specialty concrete mixtures and low density building blocks, this field seems to offer promising possibilities for the utilization of the sludge.

Aggregates and blocks containing substantial quantities of sludge showed the desirable property of unusually low specific gravity.

Growth of the project

The present experiment had its beginnings in 1946, when the National Council for Stream Improvement established a research laboratory at Kalamazoo Col-

lege to study disposal methods for deinking mill waste. The laboratory was headed by Dr. Philip F. Morgan. The work of Dr. Morgan and his staff was so promising that it was decided to build a plant for the treatment of the effluent from a deinking mill.

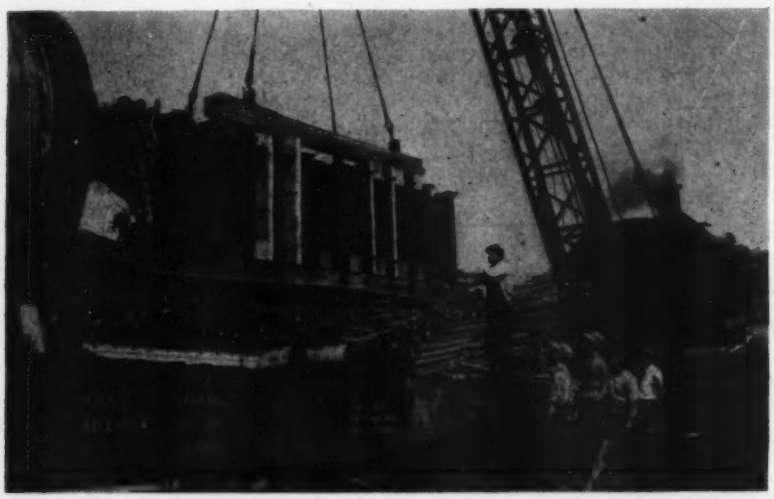
Five mills from the Kalamazoo Valley—Allied Paper Mills, Kalamazoo Paper Co., Michigan Paper Co., Rex Paper Co., and St. Regis Paper Co., together with Watervliet Paper Co. of Watervliet, formed Kalamazoo River Improvement Co. as a non-profit organization. The company built a plant at Plainwell to determine the feasibility of the treatment of deinking waste by sedimentation and aeration on a large scale.

The plant began operations in September 1950 under the supervision of Anthony Palladino of the National Council. Operation for an adequate period of time showed that sedimentation in specially designed tanks would give an effluent of greatly improved quality. This method of treatment immediately created a new problem, namely, what to do with the large quantity of concentrated sludge removed from the mill effluent.

To cope with this situation, the Improvement Co. established a research laboratory at Western Michigan during July 1951. The purpose of the laboratory has been to find some economical use for the sludge. The budget for the laboratory amounted to $8,500 for 1951-52 and $10,000 for 1952-53. Although the equipment of the facilities of the pulp and paper course at the college is at the disposal of the investigators, specialized equipment has been secured, such as a high-temperature gas furnace, an electrical muffle furnace, a ball mill, forms for the laboratory-scale production of concrete blocks, and other apparatus.

Two approaches

The staff of the new research laboratory decided to use two approaches to the problem of utilization of the deinking waste. The first and more desirable has been to modify the waste into products to be reused in papermaking operations. This approach has the advantages of eliminating the costs of marketing and transportation. However, the local paper industry may not be able to consume all of the new products made from the waste. The second approach has been to modify the waste so that it may be used by other industries. This approach gives a better chance for utilization of the total volume of the waste. Both approaches have been used by the research laboratory.



FIRST HEAVY UNITS of a $2,000,000 stainless steel evaporator plant being unloaded at Consolidated's Interlake mill at Appleton, where the firm will burn spent sulphite liquor that now flows into the Fox River

Wisconsin Mill Begins Work on Evaporator Plant

The end of serious sulphite pollution in all of the Fox River above Green Bay was forecast recently when yard crane crews at the Interlake Mill of Consolidated Water Power & Paper Co. unloaded two pieces of stainless steel equipment weighing more than 15 tons. These are the first units of the big sulphite mill's four-effect evaporator plant for concentrating spent sulphite liquor so that instead of flowing into the river, it can be burned for industrial fuel.

More than two years ago Consolidated perfected its plans for a $2,000,000 plant at the mill to reduce sulphite pollution and placed its order for evaporator equipment with General American Transportation Corp., New York, N.Y., which is licensed to manufacture the evaporators under Swedish-owned patents. Government restrictions imposed on use of stainless steel for non-defense purposes at the outset of the Korean War delayed the supplier so that fabrication of the equipment was repeatedly postponed.

The recent delivery to Interlake consisted of one heat exchanger and one vapor body. Another heat exchanger and two vapor bodies are promised for delivery this fall. That will leave two more heat exchangers and two more vapor bodies to come at an unspecified future date. General American's schedule for getting the stainless steel to make up the final units has been set back seriously by the prolonged steel strike.

Instead of awaiting completion of the entire order, Interlake is planning to set up the first two heat exchangers and three vapor bodies as a temporary two-effect evaporating plant to go into operation as early as possible this fall.

"This temporary hook-up will create extra expense of piping and setup," explained Leonard E. Smith, manager of the Interlake mill, "but we are willing to spend the extra money to try out the new equipment promptly and to reduce our sulphite pollution by a substantial fraction at the earliest possible date. By the time we get this two-effect temporary plant operating, we expect to have our liquor-burning furnace in shape to use the concentrated sulphite material in place of some boiler-room coal."

Six-Month Pulp Trends Surveyed by Puget Sound

Pulp trends ran in opposite directions in the first half of 1952, according to the mid-year survey of the national industry conducted by Puget Sound Pulp & Timber Co. Domestic production was higher. Total new supply was lower. In addition, it was found that there was an increase in the exports of American-made pulp, especially in comparison with outbound shipments of two years ago.

Pulp manufacturing operations in the United States were maintained at about 94 per cent of capacity during the January-June period, compared with full capacity operations in the same six months last year.

Reviewing the highlights as seen at mid-year, Lawson P. Turcotte, president of Puget Sound, announced that domestic production of all grades combined totaled 8,364,000 tons during the first six months, in comparison with 8,287,000 tons in the like period last year. Supplementing 1952 output was a total of 921,000 tons of imported pulp, down from 1,257,000 tons in 1951. Against a 27 per cent reduction in imports, domestic production was increased approximately 1 per cent.

Exports of American-made pulp for the first half-year period rose to 129,000

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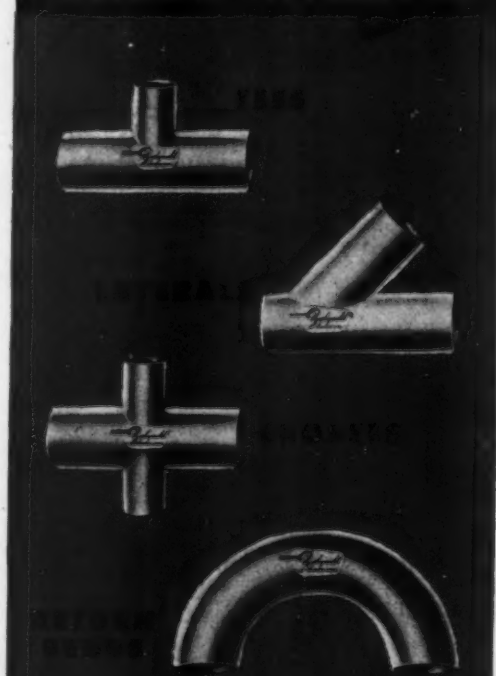

WRITE FOR CATALOGS

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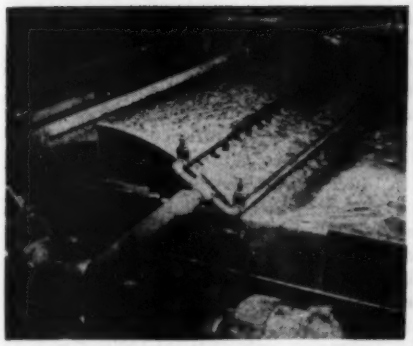


MANUFACTURING OPERATIONS at Hudson's Palatka, Fla., mill are shown in a film recently released by the firm. To the left is a scene in the pulp-washing operations, while in the center is a shot taken while "feeding" the digester. At right is S. W. Franklin, Hudson merchandising director, who was in charge of the filming

tons from 103,000 tons in 1951 and 36,000 tons in 1950.

"These shifts appear to express buyer resistance to the higher prices recently charged by foreign pulp producers," Mr. Turcotte declared. "Converting mills prefer to satisfy their requirements to the maximum extent possible with domestic pulp, a condition now operating in favor of the American industry."

New supply of pulp, composed of domestic production and import balance, totaled 9,156,000 tons in the first half of this year, against 9,441,000 tons in the same period last year. The 1952 total exceeds any previous year's first half except that of 1951.

New Processes Open Way for Using Southern Hardwoods

Two new utilization processes discovered at the Herty Foundation Laboratory Foundation in Savannah, Ga., have opened new possibilities for the South's great quantities of hardwoods, cull wood, and forest and industrial wood wastes.

One process has resulted from experiments linking kraft pulp and wood waste fiber in such a manner that the best qualities of each to produce a sheet with high tear and bursting strength are retained. Dr. Reavis Sproull, Herty technical director, declared that by cooperative effort with equipment, chemical, and engineering firms "the process has been evaluated to yield high quality, unbleached pulps suitable for use in packaging and wrapping applications." He added that the pulp can be combined with ordinary pine pulp to produce a tougher, firmer and more easily manufactured variety of kraft paper because of the strong short fibers obtainable from the hardwoods.

The second new process converts at a relatively low cost bleached pulp produced by a semichemical process from waste wood into good qualities of print and book papers and white paper suitable for coating and diversified products. Herty researchers expressed the belief that the bleached pulp is suitable for the production of most printing papers without the addition of any other fibers. Dr. Sproull explained that the process enables white papers of good quality to be successfully made from waste gumwood.

Companies cooperating with Herty by furnishing technical personnel and equipment are Noble & Wood Machine Co., Hoosick Falls, N.Y., Kinsley Chemical Co., Cleveland, and Chemcel Corp. of Cleveland and Hoosick Falls.

Kraft Paper Manufacture Shown in Hudson Film

The manufacture of kraft paper and its conversion into bags, wrapping paper, gummed sealing tape, and other kraft products is shown in a new 16 mm sound motion picture in color entitled, "From Pines to Paper." The film is available from the lending library of Hudson Pulp & Paper Corp., New York, N. Y.

The photography and script were directed by S. W. Franklin, Hudson merchandising director. The 41-minute film takes the viewer through the firm's big Palatka, Fla., operation. Not only does the movie provide all manufacturing steps—from tree-planting to finished product, but it also catches the very latest equipment in action.

Results of Dye Study Announced by U. of Maine

Results of more than two years of research have been reported by Profs. John W. Beamesderfer, Edward F. Thode and Andrew J. Chase of the University of Maine at Orono under the title, "Dye Adsorption on Wood Pulp." The report is in two parts. The first, subtitled "Adsorption of Direct Dye on Unbeaten Sulphite Pulp," was prepared in collaboration with Roswell E. Hubbard Jr. of Waterford and Framingham, Mass., a former research fellow at the school. The second part is subtitled "Relation of Dye Adsorption to the Physical Properties of Beaten Sulphite Pulp."

According to Dr. Beamesderfer, who is head of the department of chemistry at the University, the problem being investigated is unique in that only surface coverage of the wood pulp fibers is being attempted; in ordinary dyeing, complete permeation of the fibers is usually desired. The object of performing this limited dyeing is to obtain fundamental information concerning fiber surfaces.

Possible applications to the pulp and paper industry are envisaged by Dr. Thode, who is an associate professor in the school's department of chemical engineering. "While this work is strictly what is referred to as fundamental research," he declares, "our results so far have definitely shown that dye adsorption is directly related to the strength properties of finished paper. We hope that our future work will yield information concerning the properties of fiber surfaces that will be of use to the industry in controlling paper quality."

The University is continuing this research program with the cooperation and support of the Fundamental Research Committee of Tappi. By arrangement with the school's Department of Industrial Cooperation, the project is being conducted in the facilities of the department of chemical engineering under the direction of Dr. Thode.

K-C Employes Enjoy 16,000 Vacation Weeks

More than 16,000 weeks of vacation with pay were earned this year by employes of Kimberly-Clark Corp., according to an article dealing with that employe benefit in the current issue of the K-C house organ, *Cooperation*.

The vacations with pay for the hourly paid employes represent a direct cost to the firm of nearly $750,000. In addition, indirect costs not always apparent include such things as the cost involved

in rearranging work schedules, of providing vacation substitutes where needed, training costs of those substitutes, and costs of administration in scheduling all vacations.

This summer Kimberly-Clark began its 30th year of the paid vacation program for its mill people. Those on the hourly payroll who have a week's vacation now total 1,952. Those who have earned two weeks consume 5,494 weeks, while those who got three weeks take a total of 4,509 weeks.

Wellington Fund Increases Paper Stock Holdings

The Wellington Fund, one of the largest mutual investment companies in the country, increased its common stock investment in the paper industry during the first half of this year to $5,115,100. This represents an increase of $1,607,575 over the Fund's investment in paper stocks on January 1.

Wellington made the following purchases during the first six months: Crown Zellerbach Corp., 3,300 shares; International Paper Co., 9,000 shares; Marathon Corp., 20,000 shares; Scott Paper Co., 17,000 shares; Union Bag & Paper Corp., 2,000 shares, and Weyerhaeuser Timber Co., 1,000 shares.

Seven companies were represented in the paper group on June 30 last. The largest of these investments consisted of 17,000 shares of Scott. Other holdings include: Crown Zellerbach, 15,400 shares; Marathon, 30,000; Weyerhaeuser, 10,000; Union Bag & Paper, 16,000; International, 14,000, and Kimberly-Clark, 14,000.

30 Firms Given Merit Awards by Financial Paper

From the 5,000 corporation annual reports for 1951 rated in the 12th annual survey sponsored by *Financial World*, 30 pulp and paper manufacturers were cited with merit awards. The candidates thus selected are eligible for the best of industry award that will be presented at the Annual Report Awards Banquet that will be held in New York, N.Y., October 28. Last year's winner in the pulp and paper classification was Champion Paper & Fibre Co.

The 1952 candidates are as follows: Abitibi Power & Paper Co. Ltd., Bathurst Power & Paper Co. Ltd., British Columbia Forest Products, Brown Co., Carpenter Paper, Champion Paper & Fibre, Consolidated Water Power & Paper Co., Crown Zellerbach Corp., Donohue Bros. Ltd., Eastern Corp., Fraser Cos. Ltd., Great Northern Paper Co., Hammermill Paper Co., Hoberg Paper Mills, Hudson Pulp & Paper Corp., International Paper Co., Kimberly-Clark Corp., The Mead Corp., Nekoosa-Edwards Paper Co., Oxford Paper Co., Powell River Co. Ltd., Puget Sound Pulp & Timber Co., Rhinelander Paper Co., Riegel Paper Corp, Rolland Paper Ltd., St. Lawrence Corp. Ltd., St. Regis Paper Co., Howard Smith Paper Mills Ltd., S. D. Warren Co., and West Virginia Pulp & Paper Co.

The chairman of the board of judges in the competition is Dr. Carman G. Blough, C.P.A., research director of the American Institute of Accountants. He is assisted by Dr. Pierre R. Bretey, editor of *The Analysts Journal;* Denny Griswold, publisher of *Public Relations News;* Elmer C. Walzer, financial editor for the United Press; Richard W. Lambourne, president of the National Federation of Financial Analysts Societies, and Hollis Holland, authority on typography and calligraphy and a member of the faculty of Columbia University.

Survey Urges More Production in Washington

Although the State of Washington produces almost 12 per cent of the nation's wood pulp—more than any other state, its paper production runs to only 3.6 per cent of the national total. Basing its conclusion on these figures, the industrial department of the Seattle Chamber of Commerce has recently issued a report urging more actual paper production in the state.

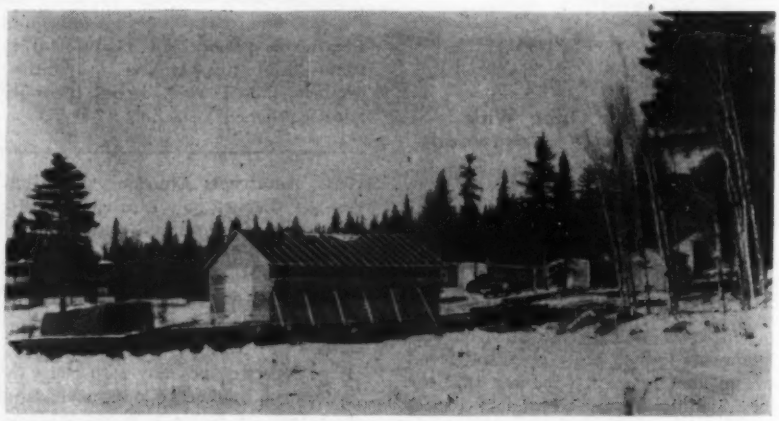
Suggesting the manufacture of cellophane or rayon, the report continues by pointing out that the Pacific Coast doesn't manufacture enough paper for its needs. Demand for all types is estimated at 15,275,000 pounds per day, against a capacity of 6,956,000 pounds daily.

"If all the pulp capable of being produced in Washington today," the report continued, "was converted into paper and paper products within the state, the over-all industry could employ 42,470 persons—more than three times the present employment estimate of 13,000."

Glass Made of Paper Filters Atom Plant Dust

Glass made of paper with its fibers so closely packed that it can filter out radioactive dust in atomic energy installations was recently exhibited in Chicago at the Trail Blazers Section of the Seventh National Chemical Exposition.

According to the National Bureau of Standards, the new type paper is many times more effective than present filters. The NBS developed the project to answer the severe problem of radioactive dust particles in the air at atomic energy plants.



NEW MANITOU LOGGING CAMP as seen during construction is a major project in the O-M logging program

O-M Begins Logging of Rugged Canadian Wilderness

AFTER SEVERAL YEARS of spade work, Ontario-Minnesota Pulp & Paper Co. Ltd.'s logging crews will begin harvesting trees this winter from the wild timberlands north of Upper Manitou Lake in Ontario. The area to be cut is some 70 miles north and east of Fort Frances.

Designated by the firm's forest management department as the "Manitou limits," an estimated 180 woodsmen will harvest more than 13,000 cords of wood from the wilderness area. The concession has been sub-divided into 14 camp operating areas. Three camps have been or are in the process of being established near or on Manitou Lake, with a fourth camp located on big Rainy Lake.

In the spring the Manitou logs are to be floated down Manitou Lake, through the Manitou River Rapids, across Sphene Lake, and over the Cascades to Rainy. They will be gathered in booms and

towed across Rainy to the O-M pulp and paper mill at Fort Frances. In the interest of maximum utilization, the larger material will be converted for uses other than pulpwood.

Several summers ago company officials reached an agreement with the provincial government for cutting operations in the area. Some time later, the limits were cruised. In 1950 the Big Canoe area near and south of Manitou Lake was cruised and added to the concession. the cruiser's findings showed that the area consisted of about 535,221 acres, of which 392,991 were considered productive timberland. In other words, 27 per cent of the area is relatively unproductive.

Most of the mature and overmature timber is located in the Upper Manitou district and immediately west and east of Upper and Lower Manitou lakes. Operations are to commence in the northern half of the concession, necessitating a large initial investment in road construction and river improvements before cutting operations can reach any appreciable size.

Harvesting plan

Working closely with production officers, the O-M forest management experts designed a tree harvesting plan for the area. The plan called for the employment of the most modern woods management practices, aimed at perpetuating the forests of the area for coming generations. The allowable cut for each camp area was established after computing separately the volume and acreage by age for each unit. In this way, each unit becomes a perpetual source of trees.

Development and operation of the concession is complicated by the fact that it lies in several different drainages and watersheds. Numerous water routes for driving and towing must be built. A large amount of haul road is required. The rugged and rocky terrain makes construction of haul roads both difficult and expensive. Road locations were mapped out in 1949 and 1950. Two roads, one leading 15 miles from camp M-400 on the upper reaches of Rainy to Manitou Lake, and another pushing its way 25 miles from Lower Manitou to the remote sections of the concession, were scheduled.

Construction problems

The 15-mile logging road from the headquarters camp on Rainy presented major roadbuilding problems to the construction crews as it twisted and turned around lakes and swamps. Modern earth-moving equipment, including bulldozers, a Malo front-end loader and a fleet of trucks, was used. The 25-mile stretch of winter road from Manitou Lake to northern parts of the limits, where most of the productive timberlands are located, will be constructed over frozen ground.

The two roads are connected by a water link across Manitou. A Gator, Wannigan, and barge had to be freighted across the 15-mile road to be used on the lake. Freight is to be trucked to Lower Manitou and shipped across the lake to connect with the 25-mile road. The barge, so large that it had to be cut in half, was freighted over the 15-mile road in two section, after which it was reassembled on Manitou.

Dam building

As in all logging operations, the spring drive was considered in all plans for adequately servicing the area. On completion of the river reconnaissance in 1949, O-M officials decided to build three dams. The dams provided the required water for sluicing logs down the river on the spring freshet. Dams were constructed at the Cascades and at Sphene Lake. The provincial government rebuilt an old government dam, located where Manitou Lake flows into Manitou River.

Camp site M-401 is situated on the upper part of Manitou. Several bunkhouses for camp M-402 on Kaminni Lake and M-403 at Noonan are being constructed and will be ready for use this winter.

SELF-LOADING TRUCKS make it possible for tree farmers to salvage much valuable timber that would otherwise decay in the woods

Self-Loading Trucks Speed Timber Salvage in West

New developments in salvage logging equipment, including self-loading trucks, are saving millions of feet of western pine sawtimber earmarked for extinction by nature. Machinery-wise small loggers, with the cooperation of tree farming industries, devise and use ingenious equipment to bring in trees felled by wind, girdled by beetles, or otherwise knocked out by natural forces.

The self-loading truck, its steel boom jutting out from behind the cab, is already a common sight in many pine areas of eastern Oregon and northern California. Capable of going anywhere an ordinary logging truck can go, the self-loader units make a business of picking up stricken trees before the wood deteriorates.

Some industrial tree farms have as many as three salvage contractors working full time saving "bug timber." The volume of useable wood reclaimed for use runs into impressive figures. Tree farm foresters call this "practical conservation."

A typical "triplex" self-loading unit is operated in Klamath County, Ore., by N. C. Vaughn and Harry Wright. Their truck yards big logs from 100 feet out, hoists them aboard, and hauls them to the mill. An engine does all the work. Under favorable conditions, the truck will yard logs up to 300 feet distant.

The two-man logging team often brings in two loads of 16-foot salvage logs a day. Payloads average about 4,000 board feet and have run as high as 5,290 feet. Twenty miles is not an unusual haul. The only logging equipment required besides the self-loader is one pickup truck and a chain saw.

Designer, builder, and owner of the Klamath "triplex" unit is Roy Menteer of Medford. He put together a Cook chain drive rear end, a Chevrolet 105 engine, a Tulsa 15-ton winch, and a

10-foot steel A-frame boom behind the cab, all mounted on a reinforced 26½-foot frame. A manually-operated hydraulic jack built into the boom helps get clearance when it is needed. A power take-off on the transmission case gives life to the loading line.

The self-loading trucks make it possible to get "bug trees" out of the woods before timber-killing beetles have a chance to multiply and spread. Pines, dead or dying from bark beetle attacks, serve as incubators for new beetle hordes that emerge to attack other trees. Windfalls still trying to stay alive, are favorite breeding spots for bark beetles.

Less vigorous, over-mature trees are most likely to become victims of beetle attack. These trees, often the largest in the forest, make the best sawlogs. Salvaging them in time stretches the country's timber supply and safeguards growing stands that will supply tomorrow's harvests.

Forest Fires Cost Nation Billion Dollars Annually

Forest fires cost the people of the United States more than a billion dollars each year, according to figures released recently by American Forest Products Industries Inc., Washington, D.C. The industry-sponsored organization, which stages the Keep America Green program, figures the country's forest fire loss this way:

In an average year the country experiences 200,000 fires. Together, these burn an area almost as large as the state of Indiana. Sawtimber consumed, if processed, would earn American labor $40,000,000 in wages. In terms of one-family units, the potential lumber burned each year by forest fires would build 86,000 homes.

Potential pulpwood trees destroyed would make enough paper to print every newspaper in the United States for 12 months. This potential pulpwood alone, were it saved and processed, would be worth approximately $600,000,000.

Costs don't stop with the value of the timber destroyed. Fighting forest blazes requires an expenditure of another $40,000,000 annually. Indirectly, there are dozens of other losses, less tangible, but equally serious. These include soil erosion, damage to fish and game, and the irreparable damage to recreational areas.

Most fires, according to surveys, are preventable. Ninety per cent are man-caused, the direct result of carelessness, ignorance, and maliciousness. The Keep America Green program, which functions locally under the banners of the individual states, is out to correct this situation through an intensive educational campaign in the field of forest protection and fire prevention.

"There's a price tag on every woods fire that burns," says AFPI. "Regardless of where you live, who you are, or what you do, part of that price comes out of your pocket."

Helicopters in New Role: as Fire Fighting Aids

The versatile helicopter may be stepping into a new role. With the forest fire problem serious in many parts of the west, the U.S. Forest Service has used it in limited numbers for patrolling above dry-hot timberlands. Helicopters have also come in handy when it is necessary to move men from one fire front to another, or when those directing the fire fighting want to get first-hand information.

The big problem is now one of getting the "flying windmills," according to I. C. Funk, who is in charge of the U.S.F.S. aviation and fire equipment activities. At present, helicopters are scarce.

Aviation as a whole is playing a vital part in combatting fires—both in actual fire fighting and in fire spotting. Not only have planes been used to transport personnel and equipment, they have also been utilized as ambulances and in dispatching smoke-jumpers from the sky into strategic areas.

Although the Forest Service owns and operates 17 of the planes, most of the aerial work is done under contract by commercial operators.

A danger rating system that helps rangers keep tab on the moisture in the brush and in fallen leaves is greatly enhanced by fire reconnaissance flights. Wind velocity, relative humidity, and the period of time since the last half-inch of rainfall are other factors that are worked into the danger rating. Relative humidity seems to be more important than temperature in contributing toward fires. Relative humidities of less than 20 per cent are especially dangerous if combined with little rainfall over an extended period.

Fires Continue to Rage

In early September forest fires continued to devastate many valuable timberland areas in the west and northwest. In British Columbia alone some 100,000 acres had been destroyed, and officials saw rain as the only means of relief. Up to mid-August some 1,227 fires had been reported in the area, with the cost of battling the blazes soaring over the quarter million-dollar mark.

State-by-State Forest Fire Record for 1950-51

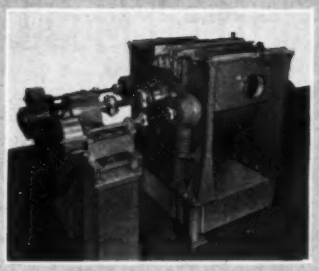
States	Acres Burned 1951	1950
Rocky Mountain Group		
Arizona	28,660	17,330
Colorado	14,123	29,371
Idaho	32,897	25,503
Montana	1,833	1,150
Nebraska	362	988
Nevada	20,777	24,487
New Mexico	97,756	109,877
South Dakota	531	3,349
Utah	3,202	11,165
Wyoming	942	304
Pacific Group		
California	288,644	488,590
Hawaii	417	189
Oregon	153,793	25,200
Washington	70,661	7,499
Eastern Group		
Connecticut	2,214	1,997
Delaware	544	342
Kentucky	251,693	285,308
Maine	3,705	18,052
Maryland	2,345	2,978
Massachusetts	9,971	9,954
New Hampshire	2,675	6,147
New Jersey	15,007	12,026
New York	11,937	8,181
Pennsylvania	33,747	36,788
Rhode Island	10,778	4,135
Vermont	808	875
Virginia	16,228	20,740
West Virginia	28,527	61,664
Southern Group		
Alabama	378,018	420,374
Arkansas	175,573	166,157
Florida	3,561,388	4,818,359
Georgia	1,111,114	2,944,066
Louisiana	470,839	433,441
Mississippi	1,084,135	1,558,294
North Carolina	208,026	484,763
Oklahoma	943,993	1,690,349
South Carolina	154,827	239,349
Tennessee	185,799	523,603
Texas	429,214	395,922
North Central Group		
Illinois	9,731	7,511
Indiana	5,033	3,948
Iowa	278	3,223
Michigan	4,868	6,274
Minnesota	34,183	8,938
Missouri	910,960	581,467
North Dakota	292	7
Ohio	5,725	15,795
Wisconsin	2,266	2,511

Source: U. S. Forest Service

Early in August 60,000 acres in north central British Columbia were ravaged, with the period without rainfall approaching a month. And as September wore on some 35,000 acres had been blackened in the Burns Lake area, along with thousands more in the southern region of the province and on Vancouver Island.

In California in the early part of last month flames had spread over some 10,000 acres of bone-dry timber in the northern and central parts of the state. However, state officials were predicting that, with luck, the conflagrations would be controlled before they got out of control.

Fires were also burning in other sec-



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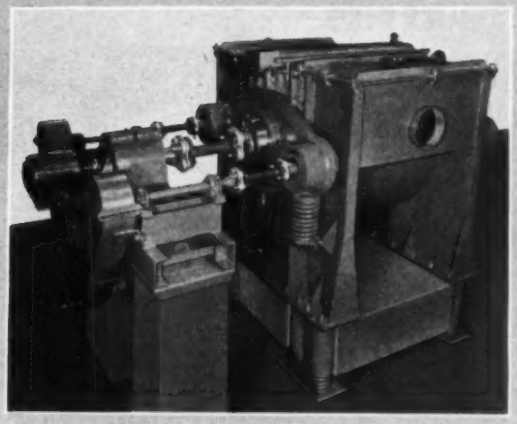

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tions of the nation. In Wyoming a September blaze was out of control in the Shoshone National Forest in the northern part of the state. Rough terrain made battling the two-square-mile blaze difficult. Smoke could be seen 50 miles distant.

Forestry Notes

Despite Exceedingly Dry Weather,
fire losses in the state of Washington were held down to 659 acres during the first two weeks of August. Thus far this year (to mid-August), 5,396 acres of state-protected forests had been razed.

Clear Cutting
has done more than anything else to bring New England's woodlands to their present low state of production, according to Harris A. Reynolds, secretary of the New England Forestry Foundation. He declared that large areas covered with slash from clear cutting have been the scenes of many of the region's most destructive fires and have encouraged the spread of forest insects and diseases.

"Forest Dusters"
are spraying thousands of acres of mountain forests in the Northwest with D.D.T. in an effort to rid the area of the spruce budworm. Hired for the job by the U.S.F.S. is the Johnson Flying Service, which uses a C-47 cargo plane and two old Ford trimotors.

1,601,000,000,000
board feet of lumber are contained in United States forests, according to an estimate by the U.S. Forest Service. New growth adds 35,000,000,000 board feet annually.

Damaging Mistletoe
is being battled by foresters in the Idaho-Montana area. The mistletoe is of the dwarf or false variety, a parasite that robs the host tree of plant food. It slows the growth of trees, distorts their shape, and sometimes kills them.

Honor Convicts
from San Quentin and Soledad state prisons in California are replanting forest lands in the state charred by fires last year. Crews from San Quentin have planted 200,000 Ponderosa and Jeffrey pine trees in the Plumas National Forest.

A Steady Decline
in the number of trees in Georgia's forests will end very soon, according to three timber men who met in Atlanta in mid-September. The men, Ed Hawes of Atlanta, Zeke Harding of Macon and Ray Shirley of Valdosta, agreed that trees grown in the state during the next three years will be more than enough to replace those cut and destroyed.

FM RADIO AND CIVIL DEFENSE is discussed at Mando's Minneapolis office by Gen. Carl A. Spaatz (right), who is seen here talking with (l to r) Maj. Gen. Luces V. Beau, Air Force officer in charge of CAP operations; Col. E. B. Miller, head of civilian defense for Minnesota, and J. B. Faegre, Mando president, who described his firm's role in guarding against enemy attack

Mando Praised for Civil Defense Role

Gen. Carl A. (Tooey) Spaatz, civilian head of the Civil Air Patrol and former commander-in-chief of the Air Force, recently complimented Minnesota & Ontario Paper Co. for making its FM radio network available in the civil defense air spotter program.

On a trip to the West Coast, General Spaatz visited the Minneapolis offices of Mando and reviewed the details of the program with Col. E. B. Miller, head of Minnesota civil defense, and J. B. Faegre, Mando president. The company radio system, comprising 35 stations located near the border in Minnesota and Ontario, has fixed base stations at International Falls, Big Falls, Kettle Falls, Warroad and the Northwest Angle in Minnesota and at Fort Frances, Atikokan and Kenora in Ontario (see THE PAPER INDUSTRY for February 1952, page 1294). Additional stations are located in the permanent logging areas. Some of these bush sets are portable, while others are at permanent camp locations.

Primarily used for logging communications, the system has been available to the Civil Defense aircraft spotters since early in 1951. Personnel who man the stations, either at the mills or in the bush, are Civil Defense volunteers on duty around the clock with a sharp eye for possible enemy planes. If the spotter sights an unidentified aircraft, he flashes this information over the radio to mill town stations. In turn, the informaton is radioed or telephoned to a filter center at Minneapolis, where the flight is tracked. In the event of attack, planes would be dispatched immediately to intercept.

At the same time, industrial centers would be informed of possible attack. Colonel Miller has estimated that such a warning by the Mando spotters would reduce casualties by 50 per cent in bombings on Midwestern cities. General Spaatz praised the system as one of the best organized of its kind in the United States and lauded the firm's action in making available its radio system to the civil defense program as a fine example of civic and community cooperation.

In its day-to-day operation the FM system is used to provide instant communication between management and woods personnel. Because much of the logging, especially in northwestern Ontario, is done in vast wilderness areas that are almost roadless, FM radio has proved to be one of the most valuable tools in Mando's modern operations. What used to take days to accomplish now takes but a few hours. Supplies and machinery parts are now flown to camp sites after an emergency has been reported. Injured personnel often owe their life to the FM radio. An injury report to a mill town sends a doctor by plane to the injured man. Meanwhile, the mill town hospital is alerted and ready to treat the injured logger when he is flown out of the bush.

Famed Paper House Dismantled

The paper house, a point of interest on the campus of the Institute of Paper Chemistry at Appleton, Wis., since 1944, has been dismantled to make way for the school's new General Activities Center. The structure, which had endured all kinds of weather during eight years, was developed as a project for a gov-

PAPER HOUSE on the grounds of the Institute of Paper Chemistry that was recently dismantled

ernment agency seeking an inexpensive, portable shelter for possible emergency housing in disaster areas.

The unit, which had a floor area of about 128 square feet, was made entirely of wastepaper prepared in the form of 21 impregnated chipboard panels treated with fire-resistant paint and joined by special metal connectors. No framing or studding was employed. The essential parts weighed slightly more than 1,000 pounds, could be packed into a package measuring 4 by 8 by 2 feet, and were assembled into the completed house in less than one hour.

Though its design was based on probable manufacturing methods, this experimental house was a laboratory creation at the Institute and was the only one produced. During its development a severe shortage of paperboard arose and continued for some time after the war; later the impregnated agent, sulphur, became scarce. Consequently, a paper house was never available for emergency use nor produced commercially. The research, however, demonstrated the structure's feasibility and stimulated the use of sulphurized board for other paper products.

Newsprint Demand Maintains Pace as Mills Operate Above Capacity

DEMAND FOR NEWSPRINT continues strong, requiring a better-than-rated capacity production effort by the industry. This while the market for other grades of paper and all grades of pulp continues to show considerable weakness. Only a year ago, according to many, newsprint wasn't carrying its full share of the load, while the demand for pulp at good prices was a big factor in industry earnings.

Whereas pulp prices have dropped sharply with a marked drop in demand since the end of June 1951, newsprint prices have been raised twice, and buyers are still eager.

Canadian newsprint makers averaged a record daily output in July of 18,462 tons, compared with the average for the year thus far of 18,304 tons. Pulp production in July was slower than in the previous month, according to industry sources.

The fact that there were only four Sundays in July is seen as the reason for a drop of 0.5 per cent in U.S. consumption that month, compared with the corresponding period a year ago. On a comparable basis, July's consumption in the U.S. was approximately 3½ per cent higher this year. For the first seven months U.S. consumption was running 1.1 per cent ahead of 1951.

In spite of the fact that use in the U.S. was down slightly from a year ago, the 485,539 tons of newsprint produced in Canadian mills in July was 7.3 per cent ahead of last year. This increase is a reflection of the continued speed-up of existing machines, coupled with the recent start-up of the new Elk Falls mill in British Columbia, which has a potential of 750,000 tons per year.

Still more capacity is expected in Canada before the end of the year. An additional 40,000 tons per year is expected soon by Powell River Co. as a result of improvements to present equipment. And Richmond Pulp & Paper at Bromptonville, Que., is scheduled to increase its annual rate to 75,000 tons (from the present 30,000) by the addition of a new machine late this year.

Markets other than the U.S. and Canada are taking the major share of the increased tonnage becoming available. Canadian output to the end of July was up 3.4 per cent, shipments to all markets, 3.9 per cent. Of the 121,951-ton increase in shipments in the first seven months of the year, 91,282 went abroad, 27,902 to the U.S., and 2,769 to Canada.

August Newsprint Statistics

Production of newsprint in Canada (including Newfoundland) during August amounted to 486,496 tons and shipments to 488,575 tons. Output in the United States was 97,831, while shipments were 99,008 tons, making a total North American production of 584,327 tons and shipments of 587,583 tons. This compares to the continental production of 586,137 tons and shipments of 580,584 tons in August a year ago. These figures were released by Newsprint Service Bureau, which pointed out that there was one work-day less in August 1952 than in the same month of 1951.

The Canadian mills produced 110,237 tons more in the first eight months of 1952 than in the corresponding period a year ago, which is an increase of 3 per cents. The output in the United States was 34,847 tons, or 4.7 per cent more than that of the first eight months of last year, making a total continental increase of 145,084 tons, or 3.3 per cent, over the comparable period of 1951.

Stocks of newsprint paper at the end of August were 142,015 tons at Canadian mills and 7,650 tons at U.S. mills, making a combined total of 149,665 tons. This compares with 152,921 tons on July 31 and 159,148 tons at the end of August 1951.

Jackson & Church Furnishes Equipment for Research

To assist Herty Foundation Laboratory at Savannah, Ga., and the University of Florida at Gainesville in carrying out an expanded experimental program with paper pulp, Jackson & Church Co. of Saginaw, Mich., has furnished some of its newest processing equipment. The laboratories have recently stepped up experimentation with all types of wood pulps and fibers in an attempt to find acceptable and profitable uses in the paper industry.

A Zenith pulp press, used for obtaining pulp consistencies up to 50 per cent, and an 015 refiner-shredder-mixer, recently designed for introducing bleach to high consistency pulp, were given Herty. An 015 machine has been installed at the Florida school, and a press similar to the one at Herty is to be made available in the near future.

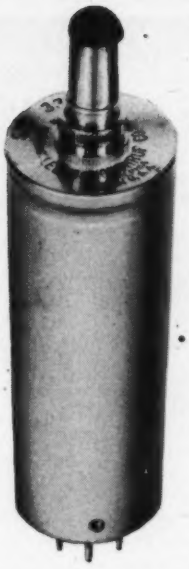
Herty is set up to carry out pilot plant experiments for firms in the cellulose field. It is using the 015 for decorticating bagasse, flax and similar agricultural fibers, as well as a bleach mixer for high density problems and studies on refining southern unbleached pulps. Zenith presses are used for dewatering pulp and as washers. Herty has other equipment designed to handle paper pulp problems on a pilot plant scale under the direction of Reavis C. Sproull, technical director, and Walter L. Hendrix, operational director.

Jackson & Church engineers, in conjunction with one of the leading paper firms and Herty personnel, recently helped carry out complete tests on high density bleaching, the results of which were termed "highly satisfactory."

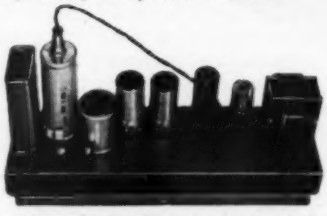
The University of Florida is currently using the 015 as a refiner, particularly on semichemical processes. It is also to be used in hot refining of kraft pulps and as a mixer for bleaching at high density. Its adaptability as a shredder for pre-softened chips, prior to continuous cooking, is to be investigated. The Zenith

A lot of engineering for a Component!

and every Speedomax user benefits by it!



Converter's job in Speedomax instruments is to receive the (often very small) direct current signal which is related to the temperature, stress pH or other condition being measured, and produce an alternating voltage. This output is amplified, and then directs the balancing system to measure, record, and if desired control.



Good engineering shows in this Amplifier's thorough filtering, high impedance, and plug-in connection to the rest of the Speedomax.

Good engineering shows in this Slidewire's non-inductive winding and in absence of any flexible leads which might form inductive loops.

Good engineering shows in this balancing motor's small size, and in its torque ample to operate accessory control and signalling fitments.

• The operating precision of the thousands of Speedomax Recorders and • Controllers which serve industry and science begins with the engineering of components like this Converter. Our specifications apply at all stages—all the way back to the plants which make metals, insulation materials, etc., for us. These specs represent also the best thinking of our suppliers' engineers. The resulting materials are thus quality-controlled for us—and us alone.

From these materials our engineers tell our factory how to make converter parts to truly tight specifications. Some parts require principally flatness, or elasticity, or dimensional stability. Reeds need correct natural frequency. Many parts of course combine various needs; each gets its requirements.

Life tests show Fidelity and Stamina. Ingenious and often original design creates from these parts a converter with noise level equivalent to only 0.2 microvolt in an emf potentiometer circuit. And this fidelity promotes accurate measurement and control.

Running on life tests since 1948, present-model converters are today still well inside performance tolerances. Such a run equals 21.9 years of 8-hours-a-day, 200-days-a-year-service—or 1.9 years more than the present age of the first Speedomax.

This kind of engineered performance is also built into the amplifier, slidewire, motor and scores of other exclusively Speedomax parts. It's at your service whether you want to control pH, speed or conductivity in the mill, or record a test in the lab. Call on L&N application engineers in selecting the exact range (from among thousands) and the exact measuring circuit (from among 2300) to meet your needs. Write our nearest office, or 4974 Stenton Avenue, Philadelphia 44, Pa.

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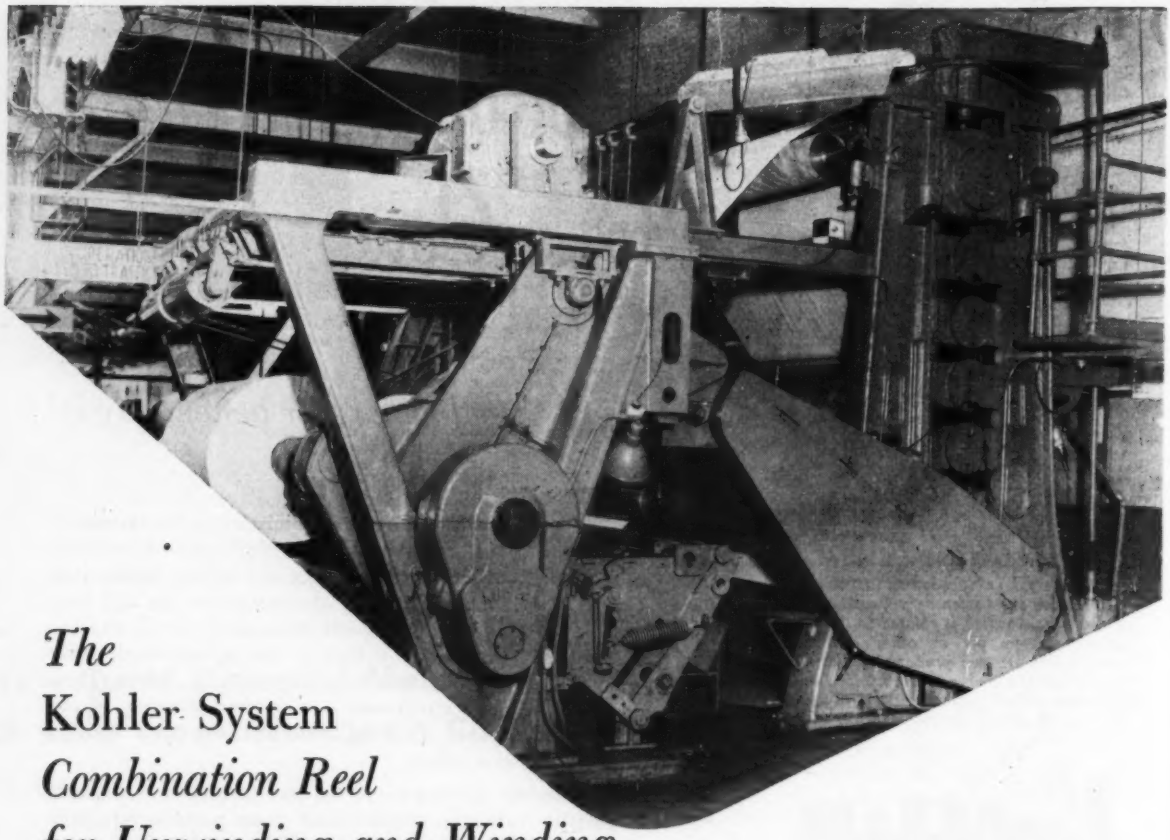

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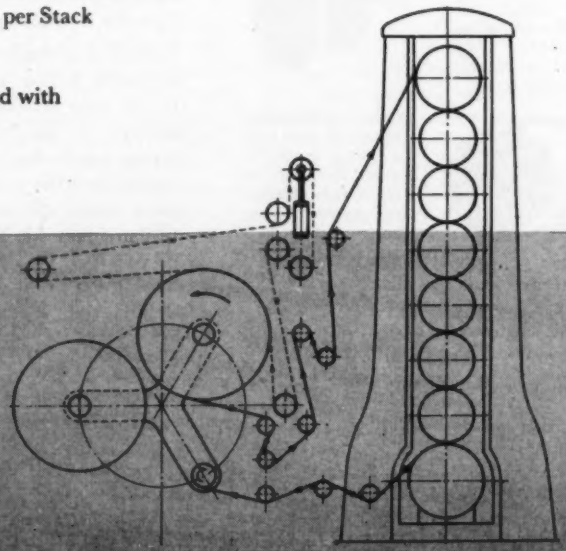
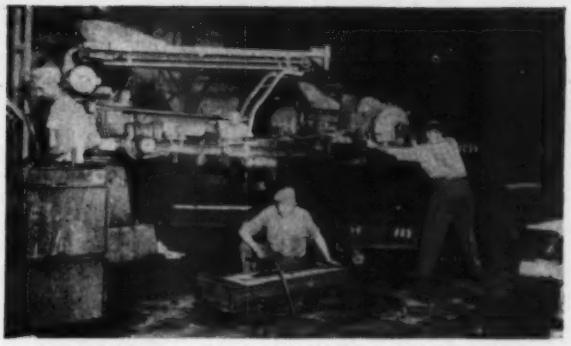


Dilts
machine works
Fulton, New York
Division of
THE BLACK-CLAWSON COMPANY, Hamilton, Ohio

GENERAL VIEW of the Keuthan molding department



"SANDSLINGER" shoots sand into molds at high speed

Keuthan Foundry Doubles Productive Capacity

Keuthan Foundry Co. of Middletown, Ohio, through continued expansion of its facilities, has recently doubled its productive capacity of small and medium size iron castings. The firm was purchased by Black-Clawson Co. in 1947 primarily for the purpose of providing castings to the Shartle Bros. Division and to augment the production of the parent company's Hamilton foundry.

Recent expansion at Keuthan includes a new fireproof structure adjoining the present foundry that adds 8,000 square feet of working area to the molding department. In the molding department are formed sand molds that receive molten metal, which when cooled and finished forms component parts of papermaking machinery built by both Black-Clawson and Shartle.

New equipment provided for the molding addition includes a large stationary machine known as a "sandslinger," which, operated by one man, mechanically packs molding sand around a pattern to form the mold. This operation was formerly accomplished by a slow and laborious manual method. Application of the "sandslinger" mechanizes the operation, with the result that molds are better formed and made more quickly with considerable labor savings.

A new unit to provide a continuous supply of sand to the "sandslinger" has also been installed in the molding department. Known as a sand conditioning unit, it functions as the name implies and can be used over and over again. All foreign materials such as nails, slag, etc., are removed prior to the addition of clay and other ingredients to augment the molding properties of the sand.

Keuthan produces castings of cast iron, alloy iron, and semi-steel and casts two special formulas of alloy castings known as BlaCloy and Sharloy—trade names owned by Black-Clawson. The firm has a present productive capacity of about 17 tons a day.

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press will be used as part of the 3-6 ton per day pilot plant to be installed in the laboratory for further exploration of continuous pulping, according to Dr. Wilson F. Brown, in charge of pulp and paper research, and Dr. William J. Nolan. The laboratory, a part of the chemical engineering section of the Engineering and Industrial Experiment Station, is now designed primarily for carrying on fundamental and applied research in pulp and paper.

Morningstar, Nicol Buys New Jersey Concern

Morningstar, Nicol Inc. recently acquired the Jersey City, N. J., factory and three departments of Innis, Speiden & Co. The natural gums and absorption base departments include the importation of a complete line of water-soluble gums, which arrive in this country in crude condition and are cleaned, refined and ground to specifications in equipment especially designed for this purpose. The processed gums are used in varied industries, such as paper goods, pharmaceuticals, cosmetics, breweries, leather goods, textiles, adhesives, foods and many other specialized manufacturing operations.

Morningstar, Nicol has arranged for the transfer of the wax department to Frank B. Ross Co. Inc. in Jersey City, but for the time being they will continue to process the waxes formerly made by Innis, Speiden until the Ross firm can absorb the manufacture in their own plant.

The purchase of the Innis, Speiden factory gives the new owners a modern concrete building of 25,000 square feet equipped with up-to-date processing equipment. Edward O'Grady, formerly manager of these departments, has joined Morningstar, Nicol in the same capacity. The new acquisition is to be reorganized as the Natural Gum and Absorption Base Department of the new parent firm.

ARCHITECT'S SKETCH of the new plant of Barco Mfg. Co., which is being constructed in Barrington, Ill. Occupancy is expected in early 1953. The plant will provide 103,000 square feet of floor space for offices, manufacturing, and other facilities, including a modern cafeteria for employees

Beckman Instruments Buys California Plant

The purchase of the business and assets of Berkeley Scientific Corp. of Richmond, Cal., by Beckman Instruments Inc., of South Pasadena has been announced by Arnold O. Beckman, president. The new unit is to be known as the Berkeley Scientific Division of Beckman.

Berkeley manufactures a line of electronic counting devices and related equipment. Capable of counting impulses as fast as 1,000,000 per second, these devices are used in a wide variety of medical, industrial, and atomic energy applications. The Richmond concern recently doubled its floor space, tripling the productive capacity.

It was also announced by Beckman recently that the engineering and architectural firm of Donald R. Warren Co.

of Los Angeles had been retained to design the new plant and offices that will be erected on a 45-acre site in the La Habra-Fullerton area. Plans call for an expandable design, with an initial floor space of 200,000 square feet.

Hooker Breaks Ground for Chlorine and Soda Unit

Ground has been broken at Montague, Mich., for Hooker Electrochemical Co.'s new $12,000,000 chlorine and caustic soda plant. The site consists of about 800 acres and is said to cover an immense salt deposit. Estimates show that under each acre is 1,000,000 tons of the mineral—enough to last 4,000 years.

In addition to the proximity of the salt deposit, the Michigan location was chosen because of the nearby big Chicago and Midwest marketing area. At present the area is being served by Hooker plants in Niagara Falls, N.Y., and Tacoma, Wash. Production will consist of chemical and chemical preparations for industries such as pulp and paper, petroleum, leather, soap, drugs, insecticides, textiles, metal-working, etc.

Allied Notes

PANDIA Inc.
of New York, N.Y., celebrated its 20th anniversary in September. The firm is successor to Paper & Industrial Appliances. R. D. Kehoe was president until his death in 1949. Since then the presidency has been in the hands of A. Whittemore. Other officers are L. G. Durant, vice president, and R. G. Goodwin, director of sales and engineering.

E. C. Atkins & Co.,
Indianapolis, has passed formally into the hands of Borg-Warner Corp. with the election of Stanley J. Roush of Pittsburgh as president and general manager. He was formerly president of Kerotest Mfg. Co.

Micro
of Freeport, Ill., a divison of Minneapolis-Honeywell Regulator Co., has instituted a new publication, *Mercury Pool*. The two-page paper contains information about Honeywell mercury switches, their features, uses, and new designs.

One of the World's Largest
volcanic sulphur deposits was announced recently by a Mexican concession that hopes to exploit the find. The sulphur is located at an inactive volcano on uninhabited Socorro Island 369 miles off the coast of northwest Mexico. Various geological groups have estimated the deposits at 800,000 tons or more at 95 per cent average purity.

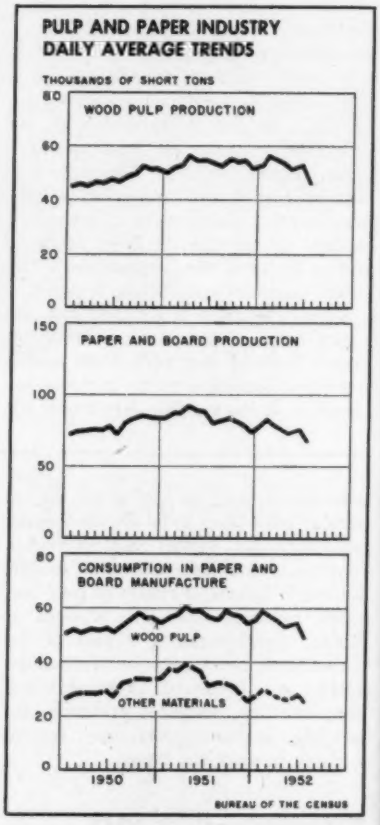
U. S. Paper and Paperboard Production

	July 1952 (tons)	June 1952 (tons)	July 1951 (tons)	Total 1951* (1,000 tons)	Total 1946
Paper and Board, total	1,761,921	1,949,028	1,996,634	26,086	19,278
Paper, total	765,587	866,549	873,856	11,622	8,752
Newsprint	90,974	93,546	89,873	1,106	773
Groundwood paper (uncoated)	60,033	63,069	57,846	789	776
Printing and converting (coated)	80,736	91,620	83,838	1,115	486
Book paper (uncoated)	97,245	123,431	112,698	1,622	1,447
Fine paper (writing, cover and text, bristols, thin paper, and other)	84,195	100,121	95,741	1,364	1,160
Coarse paper (unbleached, kraft, glassine, greaseproof, vegetable parchment, and other)	216,643	250,159	277,790	3,597	2,690
Special industrial paper	24,353	35,082	30,501	419	272
Sanitary paper	89,454	84,348	100,453	1,215	861
Tissue paper	15,126	15,988	17,876	270	184
Absorbent paper	6,828	9,185	7,240	124	103
Paperboard, total	775,103	846,294	879,004	11,605	8,396
Containerboard, total	414,114	452,363	509,123	6,347	4,315
Liners	275,110	303,987	343,176	4,205	
Corrugating material	116,466	123,735	141,385	1,815	
Container chip	22,538	24,641	24,562	328	
Bending board (folding boxboard)	230,131	249,420	241,565	2,429	2,317
Non-bending board (set-up boxboard)	52,115	57,915	56,023	701	521
Cardboard	4,381	5,915	4,766	79	89
All other paperboard	74,362	80,681	82,527	2,049	1,154†
Wet machine board	8,223	11,770	8,817	144	138
Construction paper and board, total	213,008	224,415	216,957	2,716	1,992
Building paper and insulation	102,923	114,266	100,777	1,401	1,036
Hardboard and insulation board	110,085	110,149	116,180	1,315	956

(*) Preliminary report. (†) Includes bending board and non-bending board not for use in box plants. *Source: U.S. Department of Commerce.*

July Pulp, Paper and Board Production

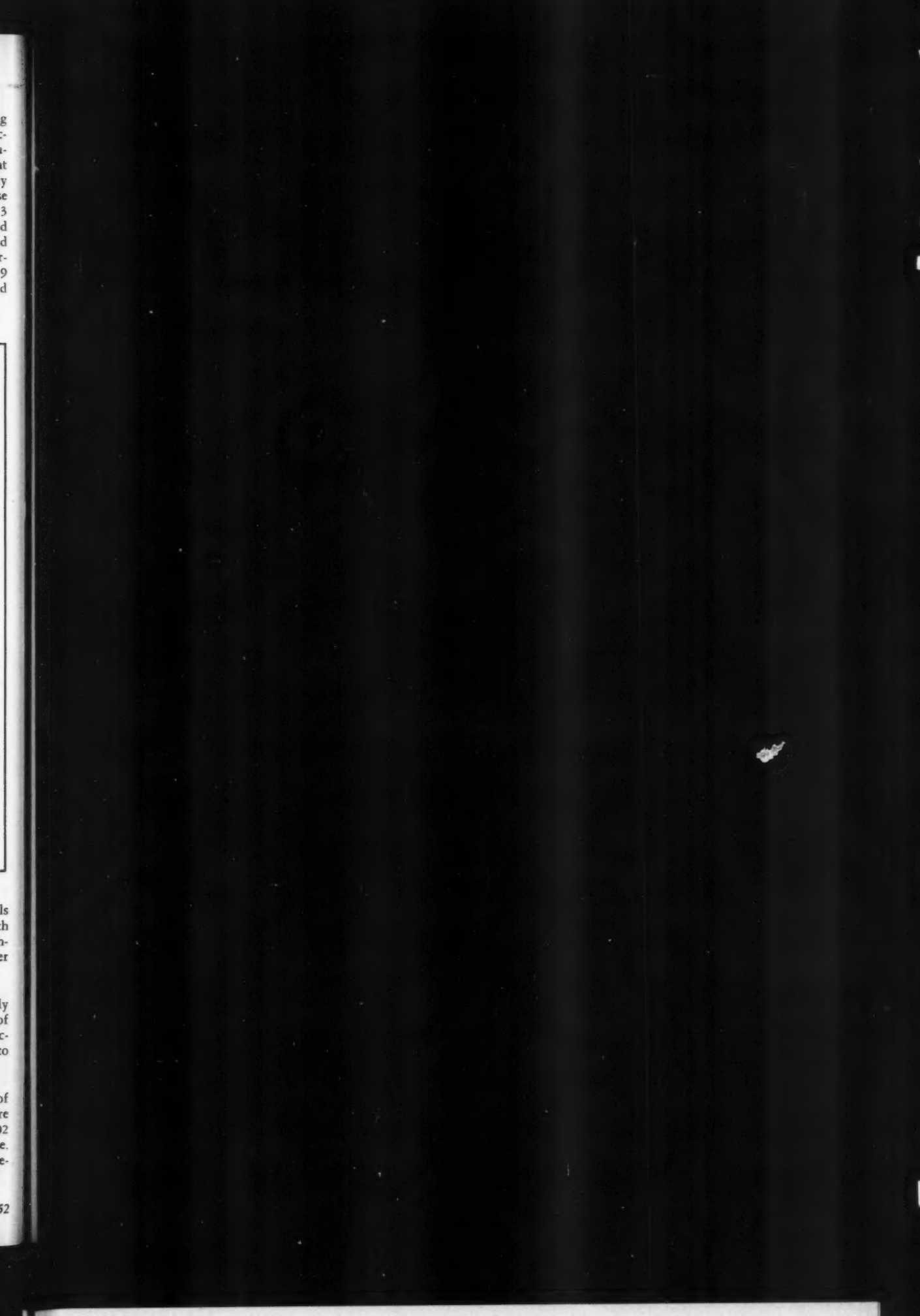
Paper and board production during July amounted to 1,761,921 tons, according to a report released by the Bureau of the Census. This is 12 per cent less than the tonnage produced in July a year ago. In terms of production base capacity, the industry operated at 63.3 per cent in July, with the paper and paperboard sections operating at 66 and 59.4 per cent, respectively. The comparable ratios for June were: Total, 72.9 per cent; paper, 77.7 per cent, and paperboard, 67.6 per cent.

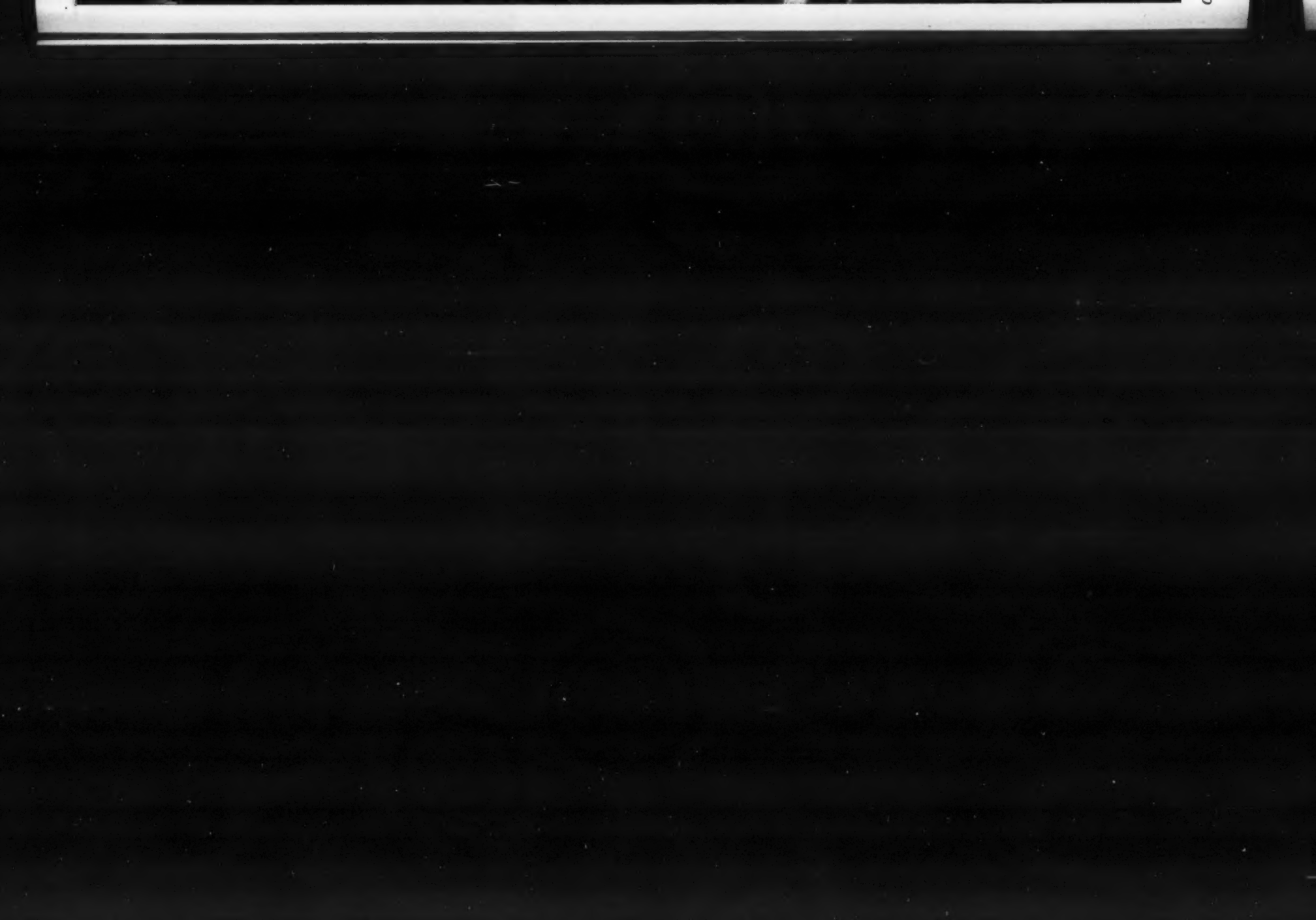


Pulpwood receipts at the pulp mills during July were 2,211,001 cords, with consumption at 1,909,782 cords. Month-end inventories increased about 6 per cent to 5,448,085 cords.

Wood pulp production during July amounted to 1,192,025 tons. In terms of production base capacity, pulp production ran at 70.1 per cent, as compared to 81.6 per cent in June.

Wood pulp inventories at the end of July at the paper and board mills were 541,368 tons, as compared to 551,902 tons reported at the end of June. Month-end stocks at the pulp mills decreased 7 per cent to 137,102 tons.





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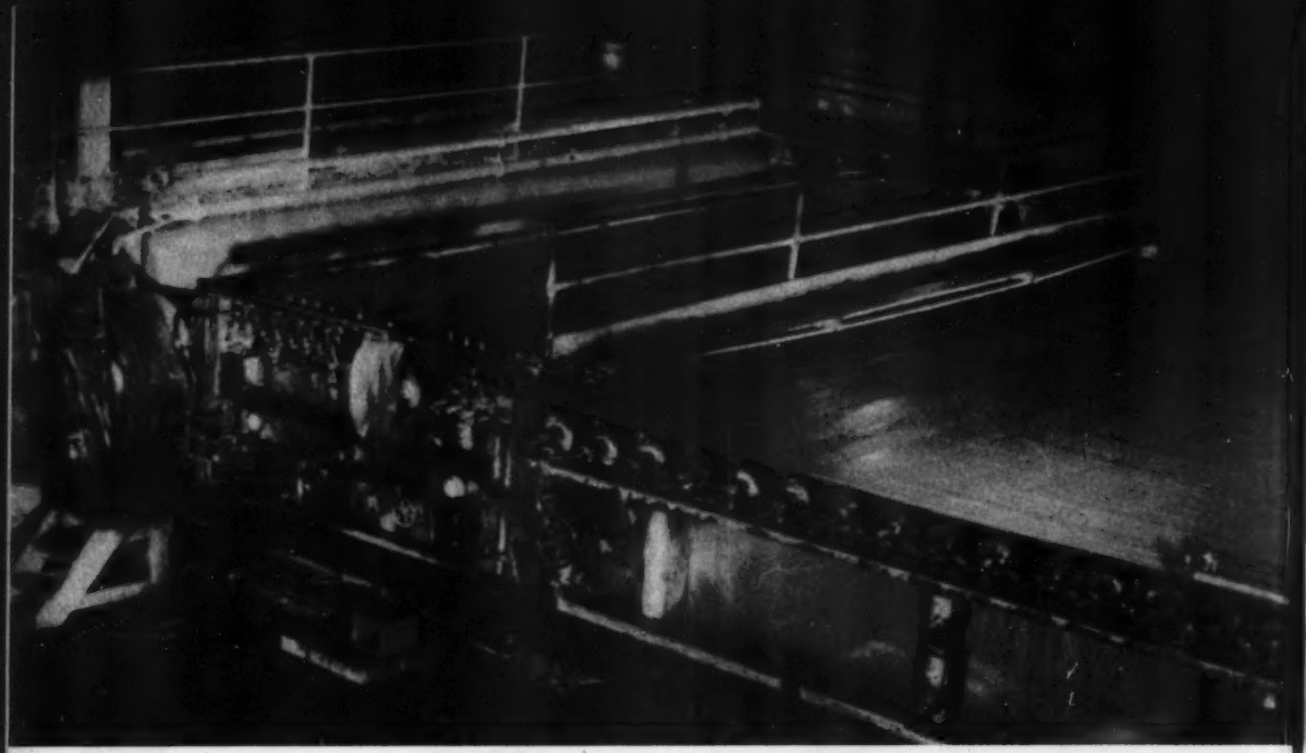


International's Gatineau Mill Boosts Quality and Output

AFTER 25 YEARS of steady growth Canadian International Paper Co.'s mill at Gatineau, Quebec, originally designed for a daily production capacity of 600 tons newsprint, is currently averaging an output of 875 tons newsprint and 200 tons of dissolving and bond types of bleached sulphite pulp. The last three years alone have brought a 65-ton increase in daily output capacity as a result of a greatly accelerated expansion program which placed special emphasis on improvement of quality and diversification of products.

The mill is ideally located near Canada's capital on the Ottawa River, a few miles below the point where the Gatineau River joins the Ottawa, thus making easily accessible to the company's operations the extensive woodland resources of the areas drained by the Gatineau with its system of lakes and tributaries. A railroad line direct to Montreal establishes contact with the important markets of Europe and the United States.

Industrial growth and expansion is invariably reflected in the caliber and ability of men responsible for such growth. Canadian International Paper's on-the-spot men who are contributing with their managerial skill and experience and technical and engineering knowledge in the implementation of the company's expansion program are: A. W. Simpson, manager; C. H. Champion, assistant manager; Alphonse McGuire, newsprint superintendent; G. D. Davidson, plant engineer; Dr. R. D. Duncan, director of research and development; Charles Lough, superintendent of woodyard; O. S. Craik, electrical superintendent; J. Irving, mechanical superintendent; Wm. Rogers, steam plant superintendent; C. Otty, sulphite superintendent; A. M. Morrison, groundwood superintendent; A. Tafel, papermill superintendent; W. J. Miller, superintendent of technical control; J. A. Hambly, bleach plant superintendent, and T. H. MacGeorge, superintendent of finishing and shipping.

Major expansions and improvements

One of the major changes that have materialized in the last three years is the sulphite liquor recovery system which supplies Commercial Alcohols Ltd. with the raw material needed for the annual production of 2,500,000 gal. of 95 per cent alcohol. The sulphite liquor recovery operation for this purpose entailed the installation of two lines of three-stage washers, the brick-lining of all blowpits, the installation of a brick-lined storage tank, as well as extensive pumping and piping changes.

Two new 18 x 47 ft. Dominion Bridge digesters, with all-welded shells, were added last winter to the sulphite pulp production system bringing the total number of digesters to 12. In the sulphite screen room all primary screens have recently been replaced with Cowan centrifugal screens.

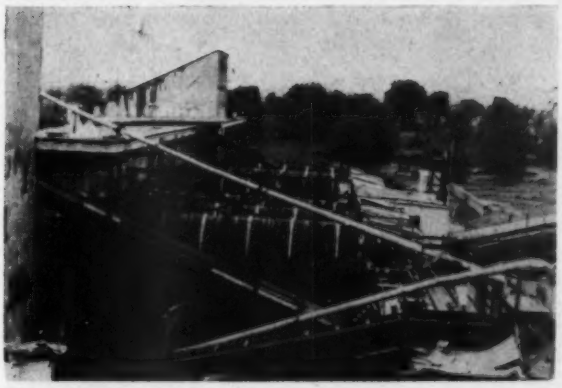
An additional sulphur burner has been installed in the acid plant. Later this year a process will go into operation that will use liquid sulphur dioxide supplied by Canadian Industries, Ltd.

In the bleachery a great number of changes have been made which have resulted in the improvement of both production capacity and quality of bleached sulphite.

The bleached pulp drying machine is equipped with suction couch and four predryers between the second and third presses. Anti-deflection rolls have been installed in the third press position and at the intermediate press.

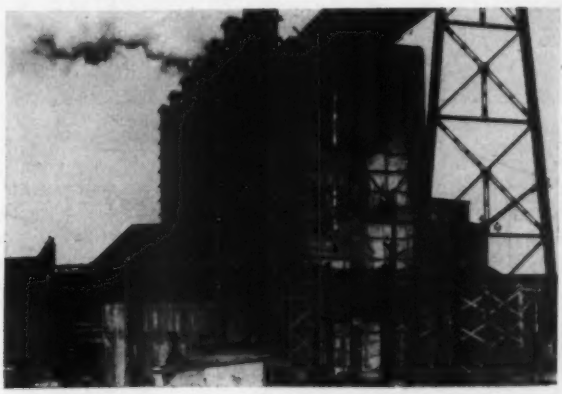
A Deculator, or deaerator, has been installed on one of the news machines. Machines will soon be equipped with two 54-inch diameter couches to replace the present 40-inch rolls. The number of Nash H12 and H10 vacuum pumps has been increased on the paper machine couches, so that each couch now absorbs

Four-foot log haul conveying pulpwood from the Ottawa River



View of the Paulson barking drums

Pulpwood entering the barking drum



Digester building and extensions for Nos. 10, 11, and 12 digesters

975 hp on the vacuum pumps. Double suction boxes are standard equipment on all couches.

In the steam plant a complete system of Aerotec tubular dust collectors, designed to trap 80 tons of fly-ash daily, is now being installed on all five boilers. A new 200,000 lb. Combustion Engineering VU type boiler will go in operation this winter and bring the total rated boiler capacity to 900,000 lb. of steam per hour.

In the groundwood mill six Bauer refiners equipped with Haug drainers have been installed, as well as Pascol coarse screens complete with a new stock tank and new pumps.

The pulp-baling system has been completely revamped and a new cutter and layboy added to the equipment.

Pulpwood system

Pulpwood logs are towed down the Ottawa River from the mouth of the Gatineau to the mill booms, where long logs are sorted from the four-foot sizes and each guided between booms to a separate log-haul. Water jets located below the surface increase the natural current and speed up the travel of the four-foot logs, which, upon arrival at the four-foot jack-ladder, are fed into the sloping deck by high-pressure water jets and elevated by travelling chains to the feed conveyor for the barking drums. Long logs are elevated to the slasher saws, cut into 4-foot lengths, and delivered by cable conveyor to the seven-chain feed conveyor and to the six 12 x 45 ft. Paulson barking drums, supplied by Canadian Ingersoll Rand Co. Barked logs are passed over sorting belt, where jack pine is separated from the spruce and fir, and conveyed by means of a dual system of cable conveyors to (a) the groundwood mill, (b) the chipper room, or (c) to eight pulpwood piles each of which can hold 23,000 cunits. Two of the piles are reserved for jack pine, which is ground separately.

Three 10-knife Carthage chippers are in operation. One of the chippers is 84 in. and two are 64 in. in diameter.

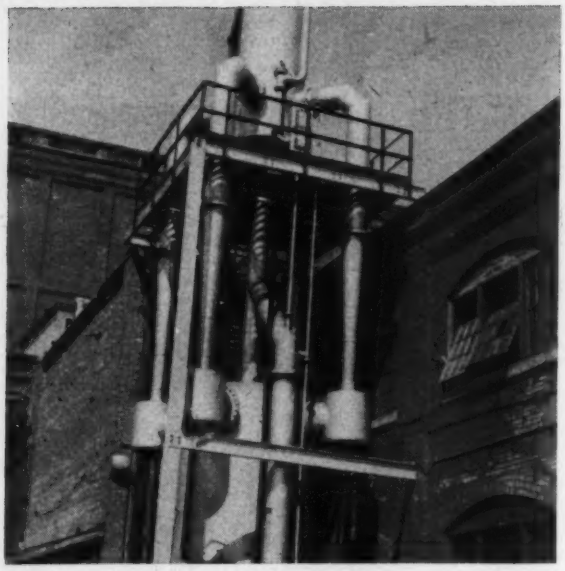
A. W. Simpson
Manager

C. H. Champion
Asst. manager

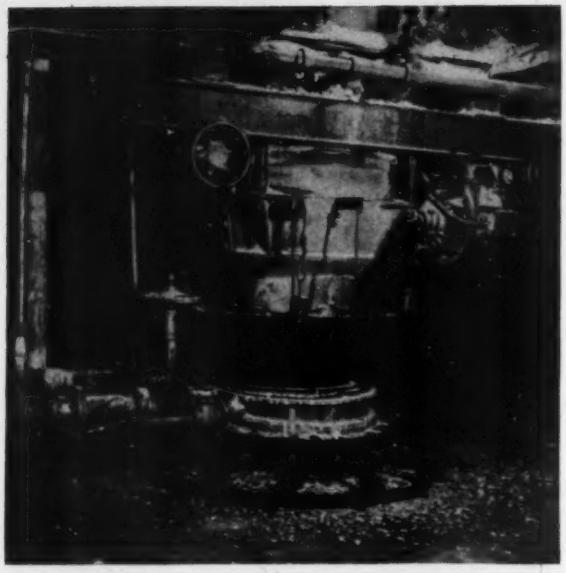
A. J. McGuire
Newsprint supt.

G. D. Davidson
Plant engineer

Dr. R. D. Duncan
Research director



Ingersoll-Rand refrigeration unit



One of two Babcock & Wilcox chip packers

The bark from the barking drums is sluiced to a scraper conveyor operating over perforated plates which enables the water to drain from the bark as it is being conveyed to two six-roll Northern Foundry bark presses. Pressed bark, containing about 65 per cent moisture, is burned in two 500 hp B.&W. boilers equipped with Dutch ovens. Excess bark is deposited in the storage pile for burning later in the season when barking operations are curtailed.

Acid plant

The burner room is equipped with three rotary 4 x 16 ft. burners, each with its own tandem type combustion chambers. Liquid level controls in the burners control the flow of liquid sulphur from the gravity feed melter. Each burner is further equipped with SO_2 recorders, vacuum-pressure recorder, and indicating pyrometers. Two burners are operated continuously, the third serving as a connected spare.

The hot gas is cooled in two Chemipulp cooler units. Gas for an acid rate up to 400 gpm can be handled by this equipment.

The tower system is a standard Jensen system with two reversible towers and one weak tower. Water supply to towers is metered. To keep the water at desired temperature in summer a Canadian Ingersoll Rand steam jet refrigerator is used.

From the towers acid is pumped into two cone-bottom settling tanks equipped with Launder rings and operated in parallel. Between the settling tanks and the four 25,000 gal. storage tanks is a 6 x 60 ft. Jensen absorption tower which may be operated at 5-15 psi.

In order to protect the operation against possible shortage of elemental sulphur from the U.S., provision is being made for the use of liquid SO_2. By October of this year a liquid sulphur dioxide system was to be ready to operate at the acid plant in conjunction with the present system.

The mill operates with a standard Chemipulp hot acid system. This consists of one 30-ft. diameter high pressure spherical accumulator operated at 42 psi, followed in series by a low pressure 30 ft. diameter blimp-shaped accumulator operated at 20 psi and a small steel accumulator operated at 10 psi. Acid from storage is pumped counter-currently through this system through an eductor on each accumulator to complete the recovery of digester relief.

Sulphite pulp production

Chips are packed by two mechanical Babcock & Wilcox chip packers into seven single lined Horton shells of 5,300 cu. ft. capacity and five double lined Dominion Bridge digesters of 7,000 cu. ft. Two digesters have welded shells, the other 10 are of standard riveted construction. Ten digesters are equipped with heat exchangers which steam the digesters automatically by means of a temperature-cam activated by the temperature of the acid leaving the heat exchanger. All digesters are equipped with Bailey and Foxboro temperature recorders, pressure recorder controllers on relief valves, liquid level gauges, and steam flow recorder controllers to operate direct steam valves. All later model digesters are equipped with Shawinigan blow valves.

Each digester has its own blowpit, of concrete construction and with digester brick lining. Nine pits are rectangular with flat bottoms. Stock is

C. H. Lough
Woodyard supt.

C. D. Otty
Sulphite supt.

A. M. Morrison
Groundwood Supt.

A. Tafel
Paper mill supt.

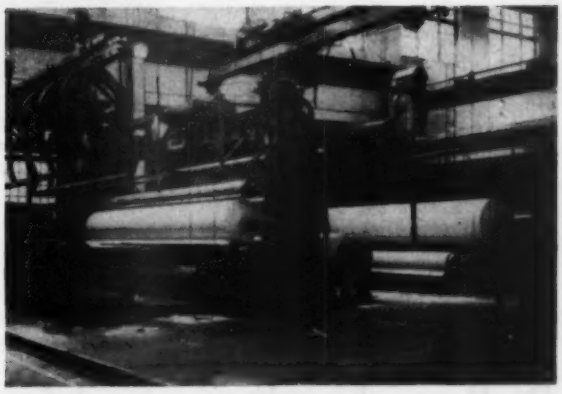
J. A. Hambly
Bleachery supt.

T. H. MacGeorge
Finishing supt.

Four Kidwell boilers generate 125,000 lbs. steam per hour

General Electric motors drive the grinders

Agitator and interior of bleach tower



English drum reel and Cameron-type winder

sluiced from these with hot liquor from a manually-operated high-pressure hose. Three pits are rectangular in shape with a pyramid-shaped bottom. These are equipped with an agitator and liquor nozzles for automatic sluicing of the hot stock.

From the blowpits the sulphite stock goes through a primary DeZurik and through a secondary Askania consistency regulator prior to entering the liquor recovery system.

Liquor recovery system

The liquor recovery system includes two lines of Sherbrooke washers. The unbleached sulphite grades are washed in a counter-current operation on three 8 x 12 ft. and one 8 x 16 ft. washers which are designed to handle 250 tons sulphite pulp per day.

The newsprint sulphite pulp is washed in similar fashion on three 8 x 10 ft. washers which have a daily processing capacity of 210 tons.

All equipment in the liquor recovery system is of stainless steel, while the liquor storage tanks are tile-lined.

Screening system

Unbleached sulphite stock is passed through four Sherbrooke knotters with ¼-inch perforations. Accepted stock from the knotters goes through two Cowan centrifugal screens and then to flat screens—arranged as primary, secondary and teritiary screens. Accepted stock from the flat screens is thickened and its consistency regulated to 3½ per cent. It is now ready for the bleachery.

Newsprint sulphite stock is similarly passed through Sherbrooke knotters and Cowan screens. Rejects from the Cowan screens go through two centrifugal tailings screens with .055-inch perforations, and the accepted stock from the tailings screens are returned to the Cowan screens. From the Cowan screens accepted stock is sent through a Dilts Hydrafiner, while all rejects from the knotters, Cowan screens, and flat screens go through a Sprout Waldron refiner for use in the wallboard mill.

Bleachery

The three-stage bleach system is of Baker design. Unbleached stock of 3½ per cent consistency is metered through a Sherbrooke meter and then allowed to flow by gravity into the chlorination tower. The amount of chlorine added is regulated by a chlorine demand test of the unbleached pulp.

From the chlorination tower the stock passes through a Sherbrooke washer and then through Hi-density thickener. It then goes through a Thorne caustic treatment tower, a further washer and a soak stage before final bleaching in continuous hypochlorite and batch hypochlorite bleaching stages.

The bleached stock is washed on an 8 x 10 ft. washer and a flat-screening operation. Accepted stock from the Waterous flat screens is thickened on an 8 x 14 ft. Oliver thickener and a Pascol decker arranged in parallel and then stored at 4 per cent consistency in a 35-ton chest.

Dissolving pulp

Dissolving pulp or bleached bond is produced on No. 5 machine at a daily rate of 200 tons. The fourdrinier wire is 132 inches wide and equipped with a 40-inch diameter couch with double suction box and mounted with two presser rolls. The main press section is equipped with two felts and includes three pairs of squeeze rolls, one main press, a second, and a third press—all with 30-inch top and 32-inch diameter bottom rolls. It has a stack dryer of 104 rolls and duplex reel stand equipped with Horton clutches.

The finishing room is completely equipped with Lamb-Grays finishing machines.

Groundwood pulping

Pulpwood, consisting of spruce, fir, and jack pine logs, is ground on 16 lines of grinders with two stones to a line—12 lines are of the continuous chain-feed type, six of which are made by Charles Walmsley and six by Waterous. The other four lines are of the hydraulic type made by Waterous. Norton pulp stones, 54-inch face and 67-inch diameter, are used in all grinders. The pump pressure on the hydraulic grinders is 200 psi. Lines are driven by 2,600 hp General Electric motors.

The operation of the grinders is automatically controlled by Taylor temperature controllers and General Electric load regulators with recording meters.

The ground stock goes through six Pascol screens. The larger material from the screens is passed through a Jeffrey shredder for use in the fiberboard mill, where a subsidiary company's well-known product, "Ten Test" Insulation Board, is manufactured.

Four 10,000 gal. per minute pumps pump the accepted stock from the Pascol screen to 12 Waterous first screens and then to 56 deckers and two filters.

Rejected stock from the Waterous first screens is passed through Waterous second screens, from where the accepted stock is returned to the Pascol screen tank, while the rejects are refined in Bauer refiners equipped with Haug drainers. The Bauer-refined stock is rechanneled through the complete screening system.

Stock preparation

Stock preparation equipment includes sulphite pulp and groundwood pulp, Trimbey regulators, primary and secondary sulphite chests, jordans, Trimbey mixers, Trimbey proportioners, and three machine chests. Two machine chests—supplying Nos. 1 and 2 machines—are propeller-agitated, while the third machine chest—supplying jointly Nos. 3 and 4 machines—has a shaft-and-paddle agitator.

Newsprint machines

Each of the four newsprint machines includes six 3A-type Bird screens equipped with 22- and 24-cut screen plates, a one-pass head box, two perforated boards, flow-eveners and Van Decarr slices. No. 2 machine has an additional recently installed piece of equipment, a Rotareaed Corp. Deculator, which eliminates foaming in the head box. The Deculator enters the system immediately after the Bird screens.

The Dominion Engineering 272-inch-wire-width fourdriniers are of the partly removable type, equipped with suction couch and presser rolls. Each couch has three H-12 and one L-11 Nash vacuum pumps connected to it.

The dry ends consist in each case of two 37-inch diameter rubber-covered suction presses, forty-seven 5-foot diameter dryers, a seven-roll calender stack, English drum reel and Cameron-type winders.

All machines have General Electric drives, with synchronized motors and cone pulleys, and General Electric Terell-type voltage regulators.

Bulk unloading problems—how to avoid them

Factors involved in unloading bulk material from a hopper car, with detail on the amount of material that gravity will not remove. One case history points up the problem and its solution.

T. S. ABBOTT
Allis-Chalmers Mfg. Co.

PRACTICALLY ALL HOPPER CARS used to transport bulk materials needed in the paper industry are built with the steel plate floor (slope sheet) slanted at an angle of 30 degrees to the horizontal. This means that bulk materials under ideal conditions with an angle of slide of 30 degrees or less will slide out of the hopper car completely under the influence of gravity. But what about all those materials that have a slide angle greater than 30 degrees? Gravity will cause only enough material to flow out of the car so that the angle between the horizontal and the top surface of the material is equal to the angle of slide. The material that remains in the space between the top surface of the material and the 30 degree steel plate floor (see Figs. 2 or 3) will not flow out of the car under the force of gravity but will require some other externally applied force to cause flow.

Table I is a listing in tabular form of a series of products that may be transported in hopper cars. After each of the products listed there is given the angle of slide, which is the angle to which a steel plate that supports the material must be tilted from the horizontal before the material will slide off due to the force of gravity. Also listed is the specific weight for each product. All the data listed are considered to be under ideal conditions unless otherwise noted. "Under ideal conditions" means that the material is sized, there is little or no moisture and no packing. This must be kept in mind when reading and using the information in this article, because there are many variables which could change the data presented here.

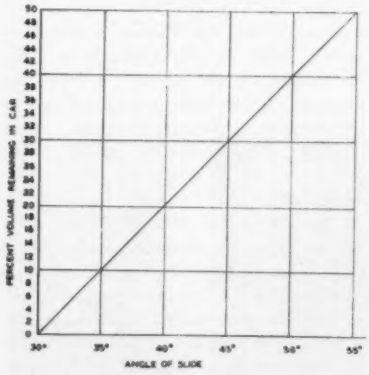
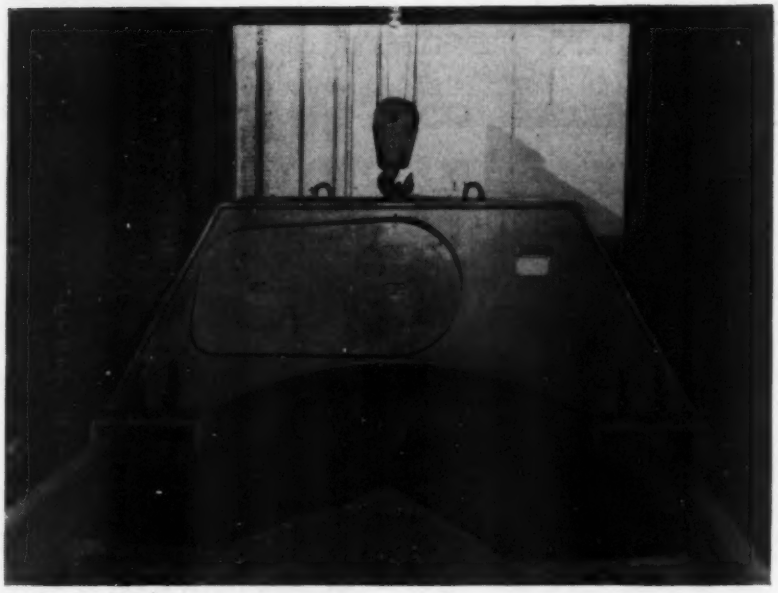


Fig. 1—Percent volume remaining in car after gravity has removed its share of the load

Typical example

To illustrate the full meaning of Table I, the angles of slide have been expanded to show graphically the percent of volume of material that remains in the hopper car after the force of gravity has removed its share of the load. A typical 50-ton car, which has a volumetric capacity of 2,100 cubic feet when loaded full to the eaves, was



Typical car shaker installation at a paper mill

chosen. Based on the dimensions of the car and the angle of slide over 30 degrees, the volume of material remaining in the car was computed and then divided by the volumetric capacity of 2,100 cubic feet, which resulted in a percentage of full load remaining in the car. The results of these calculations are shown in Fig. 1. Note that as the angle of slide increases one degree, the percentage of load remaining in the car increases close to 2 per cent.

When conditions vary from the ideal, the angle of slide increases. This in turn increases the volumetric percentage of full load that will remain in the car after gravity has done its work. This is significant in view of the fact that many of the materials listed in Table I as having a slide angle of 30 degrees or less under ideal conditions will have a slide angle of 30 degrees or more when the ideal conditions are modified. Packing in transit, moisture, and partial freezing are a few of the conditions that will increase the angle of slide. For example, when absolutely dry, bituminous coal will slide at an angle of 29 degrees, but when damp the angle of slide increases to 40 degrees. In winter there is the danger of a hard enough freeze to prevent any material from sliding, which would necessitate thawing before the material can be removed through the hopper.

Figs. 2, 3 and 4 represent material in a hopper car under the conditions as noted. The shaded area in the car represents the amount of material remaining after gravity has done its work and which must be removed by either manual or mechanical means. Unloading personnel would have to bang the sides of the car or actually climb into the car and dig or chop the material loose. This method is, of course, dangerous and involves considerable time. A mechanical method, such as a car shaker, involves the use of only one man at the controls—away from all danger and also a considerable saving in the amount of man-hours required to empty a car.

The graph in Fig. 1 still does not give a complete picture of just how much is involved in unloading from a hopper car the material that gravity does not remove. It is obvious that it is easier to move a bucket of oats than it is to move an equal volume-sized bucket of cement when both are full. Therefore, the figures obtained from the graph in Fig. 1 were expanded on a weight basis. The calculations involved three variables: (1) the specific weight—lbs. per cubic foot—of different materials; (2) the slide angle; (3) the percentage load remaining in the car. A summary is given in Table II.

Following is a brief explanation of how the calculations were made and by using the same method any of the materials given in Table I can be put through the same process. The same hopper car was used, having a volumetric capacity of 2,100 cubic feet. A product was then selected from Table I and its specific weight noted. Ashes of bituminous coal weighing 40 pounds per cubic foot are used as an example. In multiplying 2,100 cubic feet by 40 pounds per cubic foot it is found that the total load in the car, when full and level with the top, is 84,000 pounds. From Table I it is noted that ashes of bituminous coal have a slide angle of 40 degrees. Taking this figure over to the graph in Fig. 1 it is found that with a slide angle of 40 degrees there remains in the hopper car 20 per cent of the load. By multiplying 84,000 pounds by 20 per cent the weight of material remaining in the car after gravity has removed its share is determined. The amount in this case is 33,600 pounds, which is equal to 16.8 short tons. Thus, under ideal slide conditions, almost 17 tons of ashes of bituminous coal would have to be removed by either human or mechanical means after gravity has done its work.

Weight limit

When considering a problem such as presented here, another factor must be considered before drawing any conclusions. That factor is the weight limit of the hopper car. For instance, a car may have a volumetric capacity of 2,100 cubic feet with a nominal load limit of 100,000 pounds and a maximum load limit of 129,100 pounds. This means that on the basis of the nominal load limit (100,000 lbs.) any material weighing more than 47.6 pounds per cubic foot should not be loaded full and level with the top of the car, and on the basis of the maximum load limit (129,100 lbs.) any material weighing more than 61.5 pounds per cubic foot should not be loaded full and level with the top of the hopper car. This fact has an interesting effect on the results obtained for some of the materials. For example, if the car could not be loaded full and

Fig. 2—Dry Material

Fig. 3—Same material in a damp or wet condition

Fig. 4—Frozen material

level, there would be a smaller total volume of material in the car. Therefore, less material would flow out by gravity, and by the same token there might be less material remaining in the car, depending on the angle of slide and the slide conditions. However, because of the higher specific weight of the material there might be a higher total weight of material remaining in the car than there would be for a lighter product that could completely fill the hopper car.

In order to easily analyze what happens when the slide angle or specific weight varies, Table II has been prepared. The same range of specific weights was used with varying slide angles: therefore, the effect that varying either the slide angle or specific weight has on the total weight of material remaining in the car can be quickly determined.

The car shaker, when set on the eaves of the car, will cause the bottom sheets to vibrate through a small amplitude. This vibration causes the material to feed down along the sheets to the openings. Proper centrifugal force and shaker speed will result in quicker unloading without damage to car or to track-supporting structure.

To show what actually can be accomplished with a car shaker, it is well to briefly review the situation at a typical large manufacturing plant, which utilizes one of the earliest car shakers in the unloading of coal for use in the powerhouse. The flow of the coal is roughly as follows:

The hopper car full of coal is spotted over a hopper which has a capacity of approximately 10 tons. The coal is dropped into the hopper, and from there it feeds into a crusher. After the crushing operation, it is discharged into a bucket elevator. The coal is then discharged onto a conveyor which carries it to bunkers for use.

Conveying facilities

Before the car shaker was installed, three men were permanently assigned to empty the hopper cars, and during the winter months two additional men were assigned. Thus, three to five men, depending on the conditions, were continuously working to keep enough coal flowing out of the hopper cars so that a sufficient amount of coal was continuously available at the bunkers. The time required to empty a 50-ton car averaged about 1¼ hours, with variations from that figure depending on conditions. Using the average time, in summer it required 3¾ man-hours, and in the winter it required 6¼ man-hours to empty one hopper car. Unloading by this method often necessitated the men climbing into the car to pound, dig and chop at the material while they were standing on it. The accident rate on this job was the highest of all the power plant activities.

Since the car shaker was installed, only one man has been permanently assigned to emptying the hopper cars. During severe cold weather when freezing of the material takes place, a second man is assigned to handle the thawing operation.

Limitations

The actual limitation on the car shaker at this installation is dictated by the capacity of the conveying facilities. The size of the receiving hopper, the capacity of the crusher, the bucket elevator and the conveyor do not allow an entire hopper car to be unloaded at one time.

If it were not for the limitations imposed on the car shaker by the discharge facilities, a 50-ton car could be completely emptied in a matter of a few minutes when the material is not frozen. Freezing, of course, requires additional time for thawing. The single man required to operate the car shaker stands on the control platform well away from any danger of an accident. The accident rate for the entire coal unloading process was reduced to a point where an accident directly related to the coal unloading was practically eliminated. The average age of men who operate the car shaker is around 60 years, and the safety record they have built up in the operation is outstanding.

A car shaker will unload up to 15 cars of coal every hour, depending on the capacity of the material handling system and switching facilities. In one installation a series of cars are emptied without moving the cars by handling the car shaker with a mono rail hoist and moving the shaker from car to car. Each car contains different analyses and is spotted over the correct receiving hopper. Thus the products can be blended.

The principle of the car shaker is simple. It must produce a relative movement between the slope sheet of the car and the material within the car. Too low a speed of the car shaker will not produce the necessary movement, and too high a speed will damage the hopper car. By operating the car shaker only long enough to cause the material to flow out of the car, additional savings can be made in operating and maintenance costs.

Due to the variables that could enter into any given situation, the information contained in this article should be used with good judgment. The men responsible for unloading operations are best qualified to apply this information to their own situation.

TABLE I*

Description	Angle of Slide (Degrees)	Specific Weight (#/Ft.³)
Aluminum Hydrate, ground	34	13½
Aluminum Sulphate, granular	32	54
Ammonium Sulphate, damp, granulated	45	40
Bagasse, wet sawdust	45	4
Barytes, granular	30	144
Bentonite, pulverized	42	50
Calcium Oxide, powdered	43	27
Carbon, ground	21	50
Chalk, precipitated, powdered	45	18
Chips, wood	22	15–30
Cinders, (coal, ashes & clinkers)	35	40–45
Clay, dry in lumps, loose	35	40–100
Coal, anthracite, broken of any size, loose	22	52–57
Coal, anthracite, chestnut	22	46
Coal, bituminous, minus ¼" slack dry	29	40–50
Coke, pulverized	34	29
Coke, petroleum, crushed	27	33-36
Copper Sulphate, ground	31	75
Gypsum	45	142
Gypsum in irregular lumps	30	82
Gypsum, ground	40	56
Lime, briquette	26	60
Lime, burned, pebble (sized)	30	53
Lime, fine (spent dry carbide)	40	45
Limestone, pulverized	42	85
Limestone, mixed sizes	35	105
Limestone, coarse, sized	25	98
Magnesium Sulfate, (Epsom salts) crystals	25	55
Mica, ground	36	13½
Slate, fine ground	35	82
Slate, granules, flaky	28	87
Soda Ash, light	37	25–35
Soda Ash, dense	32	66
Soda Ash, briquette	22	50
Sodium Sulfite, powdered	40	96
Sodium Sulfate (fine & lumps)	31	88
Sulphur, coarse	32	76
Talc, micaceous granulated	36	62

*Stephens-Adamson Mfg. Co.

TABLE II

Slide Angle (degrees)	% Volume Remaining in Car From Figure 1	Specific Weight #/ft³	Weight Remaining in Car (lbs.)
33	6	5	630
33	6	20	2,520
33	6	30	3,780
33	6	50	6,300
33	6	60	7,560
40	15	5	1,757
40	15	20	6,300
40	15	30	9,450
40	15	50	15,750
40	15	60	18,900
50	40	5	4,200
50	40	20	16,800
50	40	30	23,200
50	40	50	42,000
50	40	60	50,400

European pulp and paper industry—its recovery and potential strength

JOSEPH E. ATCHISON
Chief, Pulp and Paper Branch
Mutual Security Agency

THE PULP AND PAPER industry has played a major role in the entire European recovery effort.

In 1947, two years after World War II had ended, a large portion of the European pulp and paper industry was in the doldrums. Many mills had been destroyed and were still in ruins, many machines had been limping along for years without repairs or much needed maintenance supplies; a large portion of the machinery was either worn out or antiquated; there were severe shortages of pulpwood, coal and power; much of the transportation system was still almost paralyzed, and capital for modernization and new investment was almost non-existent in most of the countries.

As if these problems were not enough, the Europeans found that a tremendous proportion of their prewar pulp and paper raw materials and production facilities had been cut off behind the Iron Curtain.

As a consequence of the war, Finland lost 25 per cent of its woodpulp capacity (500,000 short tons) and Germany lost about 64 per cent (1,750,000 short tons) of its capacity in the zones being administered by the Soviet Union and Poland. In addition, more than 1,000,000 cords of pulpwood per year, which had formerly flowed from Russia and the Baltic countries to the mills of Western Europe were no longer available.

Now, when we add this loss of pulpwood imports to the loss of pulp production, it is not difficult to understand some of the reasons for pessimism existing in the European industry in 1947.

ECA paying off

When ECA began operations in early 1948, a pulp and paper committee was established by the OEEC (Organization for European Economic Cooperation) in Paris. This committee was composed of top industry executives and government officials from all of the Marshall Plan countries. A U.S. pulp and paper expert from the ECA office in Paris also sat in on these meetings. The committee immediately set about the task of studying the overall problems of the European industry. It soon became evident to them, and to us in ECA, that neither mill facilities nor raw materials were adequate in Western Europe to meet the essential demands for pulp, paper and paperboard.

Since those early meetings in 1948, all possible methods of solving the many problems facing the industry have been considered. The problems are attacked by the Europeans on all fronts, through the OEEC pulp and paper committee, through their own governments, and through the efforts of each individual mill. The ECA, and the MSA merely advise, suggest, help in any way possible and, in some instances, provide the dollars which are absolutely necessary.

These problems have been considered from both a short term, and a long term standpoint. From the short term standpoint, the most logical solution involved shipment of pulpwood, pulp and paper from the Western Hemisphere to fulfill Europe's most urgent requirements. Since April 1, 1948, we have allocated $128,000,000 for the purchase of pulpwood, pulp and paper in the United States and Canada. During the first year of operations, these allocations amounted to more than $68,000,000; during the second year they totaled about $30,000,000; during the third year about $20,000,000, and during the past year about $10,000,000.

These figures show a significant trend toward recovery of the European pulp and paper industry and less dependence upon U.S. aid. Of course, as the Europeans are able to increase their own dollar earnings by sales of their goods and services to the U.S. and Canada, this dollar aid will continue to decrease until it ends entirely.

It is significant that exports of pulp and paper during 1951 from the U.S. and Canada to Europe reached record levels; yet all but a small portion of these exports were paid for with earned dollars, rather than aid dollars.

These early shipments of raw materials and semi-finished products enabled the European companies to get their mills running. Perhaps, even more important, by sale of their products they were able to begin building capital with which they could improve their mills, rehabilitate and replace machinery and increase production gradually to prewar levels.

This process continued so that, in spite of tremendous difficulties, the industry in Western Europe as a whole surpassed prewar production levels during 1951 for almost all grades of pulp, paper and paperboard. Production of all grades of paper and paperboard reached almost 11,000,000 short tons in 1951 as compared to 9,500,000 tons before the war. The table indicates the progress which has been made in production and per capita consumption.

However, the production figures alone are somewhat misleading. It must be remembered that the population has also increased from 248,000,000 in 1938 to 276,000,000 in 1951. Therefore, the per capita consumption of paper and paperboard for Western Europe as a whole was only 76 pounds during 1951 as compared to 80 pounds per capita before the war.

In line with Europe's long term program, in which ECA and MSA have played a significant role, every possible source of fibrous raw material must be exploited if Europe is to meet the potential demand for pulp and paper. In addition to softwood, these fibrous materials are hardwoods, straw, esparto and waste paper.

Austrian pulp and paper industry completely modernized

The first step in the program involves maximum utilization of softwoods. Actually there are few countries in Western Europe which have sufficient softwoods to support pulp mill expansion.

The most spectacular example of this approach is the investment program in Austria. The rich forests and the great number of rapidly moving streams available in Austria have provided ideal conditions for the development of a large pulp and paper industry. As a result of these material advantages, the industry has grown to occupy a top position in the economy of the nation.

However, the economic and political conditions prevailing in Austria during the past 20 years have made it impossible for the industry to keep pace with the rapid developments taking place in the pulp and paper industries of other countries. As a result, most of the mills became hopelessly obsolete and by 1949 it was obvious that a tremendous modernization program was absolutely necessary if the Austrian industry was to maintain and expand its important position in Europe as a major supplier of paper and pulp.

A complete survey was made of the

entire industry, including a careful estimate of the maximum production which could be supported by the available and potential pulpwood supply. It was soon realized that the potentialities were very great if an adequate investment program were vigorously carried out.

Toward the latter part of 1949, our ECA mission to Austria, our Paris headquarters, and our ECA office in Washington all urged the Austrian industry to work out a comprehensive modernization and rationalization program. Such a comprehensive program was presented by the industry in December 1949.

The entire program was studied thoroughly by the mission and by our experts from both Paris and Washington. In addition, three outstanding United States pulp and paper production men, Vance Edwardes, a Corinth, N. Y., consultant, K. O. Elderkin, then general manager of Crossett Paper Mills, and Dr. James Harrison, research director of Michigan Carton Co., spent one month in Austria making an investigation of all of the major projects in which ECA was involved.

The overall program originally called for total expenditures amounting to 984 million Austrian schillings, or the equivalent of $46 million. However, after careful screening the direct ECA dollar financing was reduced from an original estimate of $24,500,000 to $6,200,000. All possible sources of European equipment were exploited to the utmost and, of course, this equipment is being paid for in European currencies—not in dollars. Since that time, as a result of rather severe inflationary conditions in Austria, the total costs for the program have risen to 1,388 million schillings, or the equivalent of more than $65 million. However, the direct dollar aid has not been increased at all.

During 1949, when the program was presented, the industry produced 289,000 metric tons of pulp, and 224,000 tons of paper. After completion of this program, during 1953 we expect production to be 435,000 metric tons of pulp, and 350,000 tons of paper. In addition, production of board will be increased from 52,000 metric tons to 124,000 tons.

The program will contribute greatly toward supplying critical needs of the rest of Western Europe. It will provide for greatly increased foreign currency earnings for Austria. Foreign currency earnings from exports of pulp and paper in 1949 amounted to the equivalent of 20 million dollars. It was conservatively estimated then that these earnings could be increased to at least 40 million dollars.

Foreign currency earnings have already far surpassed the original estimates. They rose from the equivalent of $20 million in 1949 to $34 million in 1950 and to $70 million in 1951. Estimates have been revised, and it now appears as though pulp and paper exports may earn as much as the equivalent of $80 million during 1953. This development alone justifies the costs of the investment program.

Other European expansions

Portugal is another country which has pulpwood available to support expansion of production facilities. As a result, a project is now underway for construction of a completely integrated kraft pulp and paper mill for production of 32,000 metric tons of kraft products per year.

In Germany one project has been proposed for construction of a large kraft pulp mill. It will involve a completely integrated operation with both kraft and semichemical pulp mills operating, combined with a paper mill and board mill, multiwall bag plant and container plant. This mill expects to use a high percentage of wastewood from sawmill operations for the kraft pulp. Thus all possible sources of softwood are being exploited.

It is quite obvious that even if every available stick of softwood pulpwood in Western Europe were utilized, there would still not be enough to supply the future demand for pulp and paper. Other fibers must be exploited.

Increased use of straw, esparto, hardwoods and wastepaper offer part of the answer. Exploitation of the mixed tropical hardwoods in the overseas territories offer additional possibilities.

The use of straw has already reached a high state of development in some of the European countries. Many additional mills have been built during the past two years, and many more are now under construction.

Another interesting development in the use of annual crops is the trend toward integrated operation in the production of paper from esparto in North Africa.

Increasing use of hardwoods

In the use of hardwoods, important developments are rapidly taking place. Almost all of the mechanical pulp in Italy is made from poplar, and practically all of their newsprint is made with this poplar groundwood. For the past 20 years Italy has been cultivating poplar as a crop.

One of our important projects in this field involved expenditure of $1,650,000 for the first modern high-speed newsprint machine in Italy. Incidentally, the major portion of that machine was made by Sandy Hill in the U.S. The company, Cartiere Burgo, is using poplar entirely as a source of fibrous raw material for this machine. Thus, the European newsprint production has been increased by 30,000 tons per year without involving any new drain on the softwood supply. Many other countries are going forward with large scale cultivation of poplar for future pulpwood supplies.

Beech is being used for production of high quality dissolving pulp in Italy, Austria and Germany. Other developments are underway to expand the use of this hardwood for both dissolving pulp and semichemical pulp.

Another hardwood which has great promise for the future is eucalyptus. It can be cultivated very easily in southern Europe and north Africa and it is already in use in Portugal, Spain and Morocco. Many long term projects are under study for cultivation and use of this excellent short fibered wood. The mixed tropical hardwoods are also being studied extensively.

The use of wastepaper has expanded in Europe beyond all expectations. Its greatly increased use during 1951 was one of the principal reasons for the high level of paper and board production. In The Netherlands, for example, 42 per cent of all paper consumed was collected as wastepaper. In the U.S., we rarely collect more than 30 per cent.

Effect on U.S. pulp and paper industry

Now you might ask what effect all of these European developments will have on the U.S. pulp and paper industry. The high tariff advocates are already predicting a flood of European paper to the U.S. market unless tariffs are increased.

For the life of me I cannot see how this program can hurt the U.S. industry. In view of the great need for increased consumption of paper in Europe, combined with their high costs of raw materials, I do not foresee any appreciable increase in volume of exports of pulp and paper from Europe to the U.S.

Trend of production and consumption of Pulp and Paper in Marshall Plan countries

	Total Production of woodpulp short tons	Total Production of Paper and Paperboard short tons	Overall average per capita consumption in pounds per year
Average 1935-38	6,967,000	9,500,000	80
1947	5,031,000	6,090,000	45
1951	7,655,000	11,000,000	76

In fact, the trend seems to be in the opposite direction. At the present time the annual consumption of paper in Europe varies from country to country, but the average for Western Europe during 1951 was 76 pounds per capita. This is in contrast to almost 400 pounds per capita in the U.S. Furthermore, total consumption of paper and board in the U.S. almost doubled between 1938 and 1951, whereas the per capita consumption in Europe is still below prewar levels of 80 pounds per capita.

As industrial activity continues to increase, and as the Europeans realize the tremendous advantages in using paper for many purposes, the consumption must certainly rise. For each 10 pounds of increased consumption for the 276,000,000 people in Western Europe 1,350,000 tons of additional paper will be required.

Then, just where is the paper, the paperboard, or the raw material to produce it to come from? I feel certain that more and more of it will come from the Western Hemisphere. Already, in 1951 exports of pulp, paper and paperboard from the United States surpassed all prewar records by a large margin. This trend will continue if we do not hamstring trade with higher protective tariffs and trade restrictions.

Let us not attempt to keep out the trickle of European paper which might find its way to the U.S. during the next few years. Instead, let us make every effort to expand this trade to the utmost in both directions. Let us promote the expansion of both production and consumption of paper the world over.

If we do this, then we can be assured that the pulp and paper industry will fulfill its rightful role in building the strength of the free world.

Paper and paperboard making—XXIII

HARRY WILLIAMSON

Fourdrinier Machine Fundamental Principles— Part 3

NOW BACK TO THE slice of the fourdrinier paper machine. Impounded behind this stationary wall with an adjustable opening at its base is the continuously replenished mixed volume of papermaking fibers and water in the proportion of 0.5 per cent fiber and 99.5 per cent water.

The area immediately behind the slice proper is called the POND and the depth of this pond, across the face width of the slice, is kept at the same level by a continuous flow from the head box replacing the volume which is also continuously flowing from the slice opening, under the pressure of the pond head to the traveling wire mesh on which the endless sheet of paper is formed.

The head box, the immediate source of supply to the pond, is fitted with a suitable arrangement of baffles or revolving rolls for the purpose of regulating the speed of flow and the elimination of "selective currents." In effect the arrangement of either baffles or rolls, some of which have reverse direction rotation, is a series of "areas" designed to decelerate the initial flow speed and to create a continuous and non-turbulent even distribution of the fibers throughout the total liquid volume.

The objective is, of course, to deliver the mixed volume to the slice wall at zero speed with each individual gallon containing the correct percentage of papermaking fibers, in even suspension, and in random orientation with each other.

The slice opening

In a preceding paragraph we referred to the delivery of the mixed volume through the slice opening as "the jet like emission." While this is only another way of saying "slice velocity" the use of the words "jet like" conveys to us more graphically the possibility of forces applied to the mixed volume other than the pressure force necessary to produce the actual linear ft. speed to equal the speed of the wire.

The question of what happens to the fiber orientation subjected to this jet like force has been debated and written about ever since paper machine speeds exceeded 300 feet per minute. The article quoted on Motion of Fibers in Water, etc., was presented in 1938 and six years before that John Campbell made photographic studies of fibers in actual formation on the fourdrinier wire.

"Lessons in Paper Making Part I," by this writer, published in 1928, contains an article which deals in part with slice velocity and has this to say: "the bottom edge of the slice is beveled in the direction of flow. This adds a slightly greater speed, making the slice flow more nearly equal to the wire flow."

"It is not advisable to bevel the slice to a knife edge, such an edge would easily become serrated by the constant rush of water and, moreover, tend to catch the finer fibers giving the sheet a broken and unfelted appearance. This latter condition also occurs if the SLICES ARE WORKED TOO LOW."

There is a span of time from 1927 to 1952 during which the question of what happens to the fibers as they pass through the slice opening has been the subject of study, written articles, and, in actual operation, endless debate and diversity of opinion. The reader will note that this writer in 1927 used the words "rush of water" and now, in 1952 the words "jet like emission" are considered as a more nearly adequate description of the mixed volume being delivered from the slice opening at the speeds required by the modern fourdrinier machine.

Referring to the table "Formation Time Relative

to Machine Wire Length" in chapter three, two extremes are shown depicting the actual time in which the sheet of paper is formed. The shortest wire of 54 feet running at a speed of 10 feet per minute would give us a formation time of 92.4 seconds. The longest wire of 115 feet running at a speed of 1,500 feet per minute cuts down the formation time to ONLY 1.312 seconds.

It is obvious that, as the "head pressure" behind the slice determines the speed or velocity FROM the slice opening, the forces applied to the mixed volume as it passes through to the wire are of a greater intensity as we increase the "head height" to meet the requirements of the increased speed. Also there is much LESS time for re-orientation of the fibers from the alignment effected by the "jet forces," as they pass through the slice opening.

A typical example of the operating conditions of fourdrinier paper machines making office-use white papers from bleached wood fibers would be a wire of 84 feet in length running at speeds 500-1,100 feet per minute depending on the ream weight of the paper being made. The formation time would be from 2.873 seconds at 500 feet to ONLY 1.306 seconds for the 1,100 feet per minute speed. In the manufacture of these grades of paper GOOD EVEN FORMATION IS ESSENTIAL.

However there are also a great many fourdrinier machines with the same length of wire making high grade papers from the "seed hair" family fibers which never run over a speed of 200 feet per minute with a formation time of 7.28 seconds.

Because of these widely divergent operating conditions and the limitations of individual experience we have many different opinions and two major opposing theories as to what effect, if any, on the orientation of the fibers in suspension is caused by the passage of the mixed volume through the narrow opening at the base of the slice by the "head height pressure" which we refer to as "slice velocity." Does this "jet like emission force" cause the fibers to align themselves longitudinally in the flow stream so that they are traveling parallel to the direction of the wire?

One school of thought is of the opinion that the actual slice velocity, as such, has very little to do with the alignment of the fibers or their orientation during the actual formation. They believe the position of the fibers relative to each other during and at the completion of formation is due to the combined effects of the forces applied by the shake motion, the capillary attraction exerted on the water by the tube rolls, and the cross currents of the liquid volume as it is carried by the traveling wire AFTER it has been delivered from the slice opening.

This theory believes that the initial mat or instantaneous formation on the wire brings the liquid volume to the same speed as the wire and the only wave influence is then caused by the contact of the liquid with the deckle straps and the sideways motion of the shake device. The majority of the exponents of this theory operate fourdrinier machines making 100 per cent rag or rag content papers. The fibers they use are relatively LONG (see chapter I), and the machine speeds are ranged between a maximum of 200 feet per minute for 100 per cent rag to 400 feet per minute for the rag content papers.

Their experience over the past 40 years ranges from an arrangement in which the whole of the fourdrinier frame is LOWER at the breast roll or slice delivery point—causing the wire to run slightly UPHILL when it receives the mixed volume—to the present day operation of the wire LEVEL with the delivery board at the slice lip.

In this opearting speed range the maximum "head height" impounded behind the slice is approximately only 9 inches for 400 feet per minute and goes down as low as 2 inches for the lower speeds making a SHALLOW POND with the slice lip acting more as a LEVELING agent rather than the nozzle of a jet.

This type of operation may be summed up as LOW head, LOW slice velocity, LONG fiber, and, relatively SLOW speeds. (We must also note that the stock has been well beaten with some cutting, and the behaviour of the stock in formation is that of SLOW DRAINAGE OF WATER.)

The operators of the high speed machines are, in the main, exponents of the second major theory, namely: the effect of slice velocity on the liquid volume passing through the slice opening DOES ALIGN the fibers in suspension parallel to the wire travel and this alignment has to be offset by other means to effect good formation.

The papers made on the high-speed machines are made from the wood fiber family, the fiber length of which is much shorter than that of the seed hair family group. Because of the much higher running speeds the "head height" of the mixed volume impounded by the slice is enormously greater than that used by the slower running machines. In order to stress to the reader the importance of this "head height differential" the following table of theoretical velocities from a given head has been arranged.

The ALIGNMENT OF THE FIBERS while passing through the slice opening is in ratio to the "head height" FORCE applied and the LENGTH of the fibers to which the force IS applied.

The DISTANCE in travel on the wire that the fibers remain in parallel alignment after the "emission" of the mixed volume depends on the counteracting forces applied, the TIME RATE of formation and the TOTAL time available for formation.

Theoretical Velocities For a Given Head

Head in inches	*Head in feet*	*Velocity feet per second*	*Velocity feet per minute*
Slow Speeds			
1	.083	2.312	138.72
2	.166	3.766	225.96
3	.250	4.010	240.60
9	.750	6.950	417.0
High Speeds			
60	5.0	17.98	1078.80
72	6.0	19.67	1180.20
84	7.0	21.24	1274.40
96	8.0	22.708	1362.48
108	9.0	24.090	1445.40
114	9.5	24.750	1485.00
120	10.0	25.392	1523.52

Clean pulp from unbarked hardwoods?

THE DEVELOPMENT by Hammermill Paper Co., Howard Smith Paper Mills Ltd., and Bauer Bros. Co. of a new piece of equipment—the Centri-Cleaner—has provided the pulp and paper industry with a new tool in pulp production. The development of the Centri-Cleaner may make it possible to utilize unbarked pulpwood, increase pulp yields by recovering the fibers present in the bark, and remove the fine light dirt which is not removable by riffling, screening, or with any of the conventional types of centrifugal separator.

Should the Centri-Cleaner show as good performance in industrial applications as it has on a laboratory or pilot plant scale, its use may considerably reduce the cost of paper production. As claimed by its manufacturer, this equipment would make it possible to utilize dirty, rough and even unbarked pulpwood. Its installation would also minimize space requirements by replacing many screening operations.

The striking advantage incorporated in the Centri-Cleaner is that separation does not depend on the specific gravity of the dirt particles alone, but also on the specific surface and shape of the particles. It is because of this that such particles as bark, specks and other lightweight solids can be separated from pulp fiber slurries.

Centrifugal action and shear

A simultaneous application of the centrifugal force and shear is required to obtain good separation of dirt particles from the pulp fiber. Such a double effect is obtained through the free-vortex turbulence created through a tangential introduction of the stock mixture under 40-50 psi into the conically-shaped separator.

As described by Dr. G. H. Tomlinson, research director of Howard Smith, and shown in Figure 1, the Centri-Cleaner consists essentially of a hollow truncated cone (1), the top of which is joined to a cylindrical head (2). The rejected stock discharge (5) is situated at the truncated apex of the cone. The stock inlet is normally rectangular in cross-section with a long axis in the direction of the axis of the unit; it is set tangentially to, and near the top of, the head.

The Centri-Cleaners are designed to take full advantage of the free-vortex forces which are expressed by the equation $V_1R_1 = V_2R_2$ where V_1 is the tangential velocity at radius R_1 and V_2 the tangential velocity at radius R_2. It can readily be seen that the fluid velocity is accelerated rapidly and uniformly in the

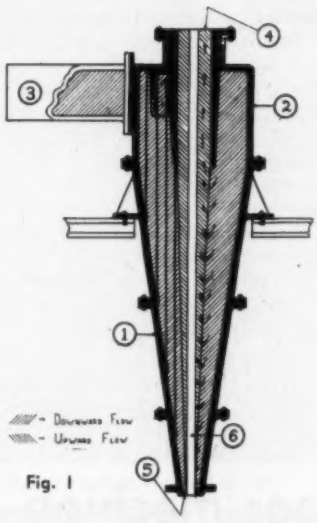


Fig. 1

open conical section of the unit, the rpm increasing more rapidly with decreasing radius.

Thus one can visualize successive layers of liquid revolving about the axis, and each successive lower layer rotating more rapidly. The resultant shear between the layers seems to bring about a situation which permits fiber and shive to pass each other, each following its independent route.

Forces defined

The stock suspension, injected tangentially into the unit at 40 to 50 psi, immediately develops a rotating motion. The suspension spirals downward and inward and transfers to an upward spiralling column of liquid extending from the rejects outlet to the accepted stock outlet. The centrifugal force develops to a maximum at the bottom orifice where the rejected material is discharged. Dr. Tomlinson reports that, by using a transparent cone section, velocities in excess of 4,000 rpm have been observed at points below the 2-inch radius, while the calculated velocity at the periphery of the cylindrical section is about 330 rpm.

The forces operating in the Centri-Cleaner have been defined as (1) a pressure differential from the periphery of the cylinder towards the central, liquid-free axis and towards the bottom of the cone; (2) the centrifugal forces caused by the rotating liquid; and (3) the angular velocity gradient from the periphery to the liquid-free axis.

"The pressure differential," as explained by Dr. Tomlinson, "causes the liquid to move towards the center of the unit and towards the apex of the cone. Fiber and dirt in passing through the fields of successively increasing centrifugal force tend to slow down in relation to their inward radial travel. A third particle reaching the centrifugal field which counterbalances the radial flow will be carried down in this field by the downward component of liquid flow until it reaches the cone. The fibers have a high length to diameter ratio and tend to overlap into zones of faster tangential velocity. They will be carried towards the center of the whirlpool and finally up to the accepted stock orifice. The dirt, together with some fiber, is carried down towards the apex of the cone where it is continuously discharged."

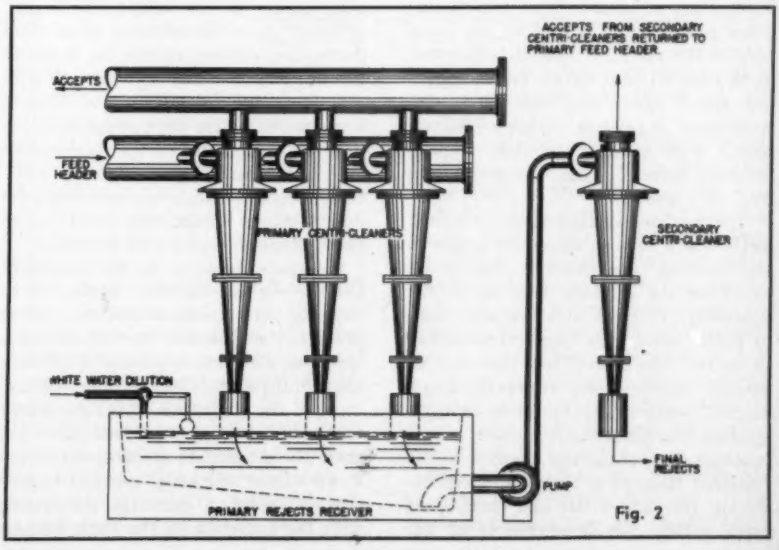


Fig. 2

Typical installation

A typical plant installation of Centri-Cleaners is shown in Figure 2. A series of primary Centri-Cleaners are connected in parallel, and the rejects from these primaries containing dirt and some fiber are passed through a single secondary Centri-Cleaner. The accepted stock from the secondary is returned to the primary header.

Centri-Cleaners can be used on bleached and unbleached pulps and can be installed in many different locations in the pulp paper mill. The optimum consistency of pulp passed through the Centri-Cleaner is about 0.5 per cent, although consistency can be varied in the range of 0.2 to 1 per cent. Centri-Cleaners have capacities ranging from 0.5—60 tons per day.

Larger size Centri-Cleaners are being considered for installation immediately following the knotters where, because of their larger size, these units tend to reject larger pieces of bark and other dirt, along with fiber aggregates and shives. The smaller size Centri-Cleaners, such as the 4-inch units are best suited for the separation of extremely fine dirt particles and are used in refining stock mixtures for the paper mill.

The power required for pumping stock through the Centri-Cleaner is about 1 hp a day per ton of pulp, and cone inlet pressure ranges from 40 to 50 psi in normal operations.

Floor space requirement is about one square foot per daily ton of pulp for the large size Centri-Cleaners and somewhat less for the smaller sizes.

This new device was first developed by Hammermill Paper Co. for general utility cleaning, as reported by E. R. Rastatter and Dr. A. M. Croup

The Centri-Cleaners, as manufactured by Bauer Bros., who have acquired both U.S. and Canadian patent rights, are made of interchangeable cast iron sections or are molded in interchangeable parts of shock-resistant hard rubber compounds. Those made of cast iron are protected against erosion and corrosion by a precision molded lining of vinyl plastic.

The sectional paper machine drive and operating efficiency

C. D. BECK
General Electric Co.

TREMENDOUS ADVANCES have been made in the design of paper machine drives in the past few years. This has been stimulated by the demand for precise drive performance on today's wider, higher speed paper machines and by the greater cost of "outage or down time" on these high production machines.

With a sectional drive, the various sections of the paper machine are driven by individual dc motors. Each motor (in special applications, a small group of motors) is powered by a separate dc generator. The relative speeds of the motors are adjustable from control stations conveniently located at the front side of the machine. Special tachometer generators on each section motor supply the speed signal and then electronic-amplidyne regulators maintain the set speed with utmost precision. Typical sectional drive components are shown in Figs. 1, 2 and 3.

The mechanical drive employs a lineshaft which extends the entire length of the machine. The lineshaft may be located on the machine floor or in the basement. Turbines are invariably used as prime movers on large machines because the first cost is less than for an electric motor drive. However, single electric motor drives are often used on smaller machines. Each section of the machine is mechanically coupled to the lineshaft through a clutch, a speed reducing gear and a flat belt running on taper pulleys, which permits speed adjustment of each individual section. Recently, differential gears controlled from PIV's have been used in place of belts.

Performance

The most important single requirement of any paper machine drive is the ability to reliably and consistently maintain uniform differential speed (draw) between sections. Up-to-date sectional electric or mechanical drives of comparable quality effectively meet this requirement and appear to meet it equally well.

The speed of response of mechanical and electronic amplidyne controlled sectional drives to machine disturbances also appear to be about on a par. Whether these disturbances arise from fluctuating vacuum on the flat boxes or from a sheet break between the last dryer and the calender, draw disturbances in each case are comparable.

While comparable on the most important and essential points, many additional features which can effectively reduce machine outage time can be more easily obtained with an electric drive.

Immediate Response to the Operator's Controls—"Slack take-up," applicable to any and all sections except the couch, permits the operator to momentarily speed up a section to effectively remove slack in the sheet. Over or under adjustment of the slack take-up is no problem with an electronic amplidyne drive because the momentary speed-up and slow-down to the operating speed is instantaneous, from a practical standpoint, with the operation of the slack take-up pushbutton. With a mechanical drive or a differential type electric drive, slack take-up is inherently a slow correction because the controls must mechanically move a belt or change the diameter of a sheave to effect the speed-up and slow-down of a single section.

"Over-controlling" the draws is also avoided with the electronic amplidyne drive because of its immediate response to a draw control adjustment by the operator.

Slow Speed—Slow speed operation and jogging is essential on the couch or wire drive for scouring and spotting the wire and for making mechanical adjustments or repairs to the fourdrinier. Slow speed on the presses facilitates shrinking in felts and pulling out wrinkles. Slow speed reduces the time required to replace dryer felts and to accurately spot dryer canvas seams. With a multiple generator electric drive, any or all sections can be operated at a uniformly regulated slow or crawling speed with any or all of the remaining sections stopped or running at normal operating speed.

Reversing—Reversing at slow speed can be easily provided on any section, as required. Reversing is most effective on the calenders to facilitate removal of "plugs." On dryers, reversing reduces the time required to remove broke after a "wrap around" and simplifies "spotting" of dryer felt seams.

Quick Stopping—Quick stopping by controlled regenerative braking often reduces the amount of damage to machine clothing in an emergency. It also ma-

Fig. 1—Paper machine driven by an electronic-amplidyne controlled sectional drive

Fig. 2—Eleven dc motors drive the paper machine shown in Fig. 1

Fig. 3—One of the two motor generator sets supplying power to the dc motors shown in Fig. 2

terially reduces outage time on a "dryer wrap-around" because it reduces the stopping time of heavy inertia dryer sections.

Controlled Rates of Acceleration (Starting)—Each section of the machine can be started and accelerated to the operating speed at an optimum rate for that particular section without affecting running performance of the other sections. Also, since each section is powered by an individual drive, the starting of one section has no effect on the speed of other operating sections.

Load Indication—With a sectional electric drive, ammeters are used to indicate the load carried by each section. Ammeters are a valuable tool for the papermakers, as well as the electrical and mechanical maintenance crew. Papermakers soon learn to associate section load readings with machine performance. Ammeters, for example, may indicate:

1. Water in the dryers caused by poor evacuation.
2. Vacuum fluctuations on the wire.
3. Uneven flow of stock to the fourdrinier.
4. Excessive press loads due to faulty suction roll operation.
5. Felt tensions on presses with common felts. In addition, ammeters provide a measure of sheet tension at the dry end of the paper machine.

To the maintenance crew, load readings are a measure of machine mechanical condition—often permitting them to detect potential sources of bearing failure, machine misalignment, and mechanical wear before they actually force an unanticipated shut-down of the machine.

Tension Control—In all phases of papermaking and processing, from the couch draw to the sheeter or the final rewind, accurate tension control improves paper quality. The paper Tensiometer by General Electric has made "the papermaker's dream" a partial reality. It will indicate sheet tension or, in conjunction with an electronic amplidyne controlled sectional drive, it will accurately regulate sheet tension at the dry end of the paper machine, such as at the dryer, calender, and reel draws, Figs. 4 and 5.

Draw Motors—Tension control is not practical today on the wet end of the machine because the wet sheet cannot

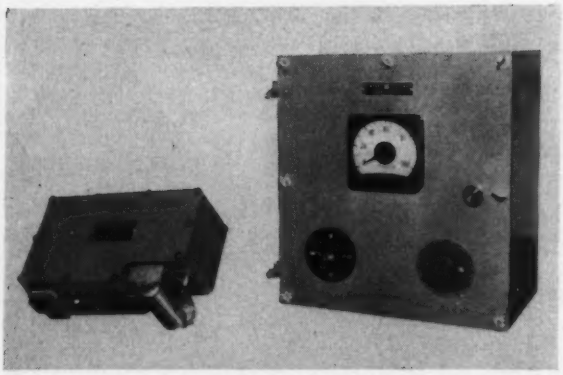


Fig. 4—Tensiometer consists of power unit, tension meter and operator's controls (right) and tension measuring head (left)

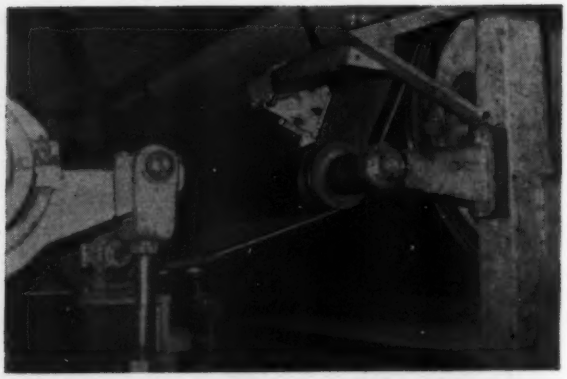


Fig. 5—Tensiometer for regulating sheet tension between a dryer section and a breaker stack

support a tension indicating roller which will give a reliable tension signal. At the wet end of the paper machine, sheet tension is best controlled indirectly by monitoring the "feet draw" between any two adjacent sections. While "draw meters," Fig. 6, are adaptable to any machine, they are less costly and more easily applied to the G.E. sectional drive because they can operate from the speed regulating tachometer generators.

Draw meters simplify the setting of draws because any draw setting can be recorded and duplicated at a later date. They also provide a continuous indication of drive performance. One mill is using the couch-to-press draw meter reading as a "quality control measurement" to check its stock preparation and refining processes.

Flexibility

Sectional drives readily accommodate changing machine conditions and method of operation, as well as facilitating novel control features to meet special machine conditions.

Occasionally it is necessary to temporarily replace a press roll with one of a different diameter. Within practical limits, usually dictated by the machine rather than the drive, a change in roll diameter may be accommodated by a simple rheostat adjustment with a multiple generator sectional drive.

Auxiliary drives such as top press and breaker stack rolls, wire return rolls, suction breast roll and fly rolls, as well as special multi-motored machine coaters, can often be more economically applied with an electric drive.

Electric drives are a natural for powering two or more independent sections operating on a common felt or wire. One motor may operate as a helper, or both may be speed regulated. In either case, the motors hold adjustable relative speeds to maintain the correct draw or felt tension between sections. Here again, ammeters are indispensable guides to most efficient machine operation and improved felt life, because they provide a measure of the tension carried in the felt.

The wet end of the Yankee machine shown in Fig. 7 is an application of this type. Here five motors drive the common felt from the couch roll to the Yankee dryer. When required to meet changing machine conditions, two standard sections of a conventional paper machine, such as the first and second press, or the fourdrinier and the presses can be readily modified to operate on a common felt.

On cylinder machines equipped with wet end helper drives, the load carried on the helper motors can be automatically controlled as a function of first press load (first press motor current). On some applications this will provide a more uniform tension in the felt entering the main press without repeated manual adjustments when the machine is being threaded, or when changes in nip pressure are being made.

Today many mills are demanding precise speed control of machine stock pumps. Standard paper machine speed regulators meet the requirements of this application and are often supplied as an additional coordinated section with a sectional drive.

Beta ray thickness gages are being successfully used on paper machines to continuously monitor the basis weight of the sheet. In the near future it is expected that basis paper weight can be regulated by continuous adjustment of over-all paper machine speed or by adjustment of stock pump speed.

On large dryer sections several in-drives each with a separate motor may be used to reduce the load imposed on the dryer gears. When required, two single or multi-motored dryer sections may be operated as independent speed regulated sections or geared together and operated as a single dryer group. In either arrangement each motor will carry its fair share of the load. Again, ammeters provide the operator with a positive indication of the load carried on each in-drive.

There is no limit to the amount of power which can be handled by one or several motors on a single section. One G.E. drive employs two 500 hp motors on the couch roll of a large fourdrinier. In fact, the higher the power requirements, the more economical the electronic amplidyne sectional drive becomes.

When new drives are installed on existing machines, loss of production during the change-over can be materially reduced with a multiple generator drive. Each regulated section is a complete and independent drive. Thus, one or several sections may be installed and put into operation on each of several week-end shutdowns.

Steam balance

An optimum steam and power balance is of major importance in today's high production mills because the cost for heat and electricity per ton of paper appears to increase appreciably as paper machine speeds go up. A comparison of the economics of obtaining process steam from the smaller mechanical drive turbines versus large powerhouse turbines must be considered on an over-all mill basis. The index of any comparison will be energy—both BTU's of steam and KWH's of energy per pound of fuel burned in the boiler.

Future expansion and flexibility of over-all mill operation must also be considered in any heat balance comparison. As an example, many existing mills today are increasing the paper machine drying capacity by raising the dryer steam pressure. In many installations this can upset the steam and power balance because the paper machine turbine capacity is reduced with increased exhaust (dryer) pressure for a given steam flow. Also, the process steam available from a mechanical (paper machine) drive turbine will match the dryer requirements at only one operating speed.

When the over-all heat balance dictates a paper machine drive turbine, the

operating features of an electric sectional drive can be retained by powering the dc generator set from a turbine instead of the more conventional synchronous motor.

Maintenance

Numerous attempts have been made to compare maintenance expense and down-time for sectional electric and for mechanical paper machine drives. No factual and conclusive results have been obtained, because there are no two essentially identical paper machines, each with up-to-date mechanical and electric drives in operation. Thus, the comparison of maintenance expense must be evaluated on a more general basis.

Generally speaking, the maintenance is the responsibility of the electrical department on the one hand and, on the other, that of the mechanical department. Electrical maintenance will require service and conditioning of motors, generators, amplidyne generators, parallel shaft speed reducers, and control. Mechanical drive maintenance involves primarily a turbine, anti-friction bearings, gears, belts or PIV units, clutches, alignment maintenance, and control (draw adjusting motors and their control).

Operating experience on electric drives has proven that, as would be expected, the rotating equipment, namely motors and generators, involve the lion's share of the electrical maintenance. The control consisting primarily of liberally rated static components can give little trouble if properly installed and kept clean and dry at accepted ambient temperatures normally not exceeding 40C. Electronic tubes are applied in conservatively designed circuits which do not require maximum performance from the tubes for acceptable machine operation. Conservative circuit design, together with present vacuum (hard) tube reliability, has essentially eliminated the electronic tube as a maintenance problem.

The type of maintenance actually is a secondary consideration by comparison to the actual hours per month that the paper machine is not producing. Sectional electric drives can reduce over-all machine maintenance time by permitting the fullest coordinated use of the electricians, the machine tenders and the mechanical crew when the paper machine is out of production on a scheduled shutdown or for a wire change.

The electric drive is arranged so that the drives for the couch and the three presses can be shut down for electrical maintenance while the dryers, calender and reel can be run on slow or at any operating speed to facilitate machine maintenance. Likewise, when mechanical repairs or clothing changes are being made on the wet end, all dry end drives can be taken out of service for electrical repair or inspection. On up-to-date drives, provision is also included for jogging or operating any section of the paper machine at slow speeds with all of the electronic cotrols taken out of service for testing or repair.

This machine flexibility can reduce machine outage time materially through the use of an effective maintenance program, utilizing, to the fullest extent, the entire mill crew. This is most significant in mills which operate on only two or three short shutdowns a year.

First cost

The relative first cost of a sectional drive versus a mechanical drive with a steam turbine will vary with the total horsepower required and the number of driven machine sections. Generally speaking, the electric drive will be most economical for medium and large size machines with a relatively few regulated sections, whereas, the mechanical drive will be less costly for small to medium size machines with a large number of sections. When large horsepowers are involved per section, the sectional drive will usually have a definite price advantage. From the standpoint of installed cost, the sectional drive can often show an additional cost advantage.

Recent improvements

New sectional drives will provide even better performance with less servicing and lower maintenance expense. The following are some of the improvements being incorporated into new paper machine drives to further reduce machine outage time.

1. Amplidynes are selected for maximum interchangeability of units. In fact, all paper machine and winder drive amplidynes are identical and interchangeable except for kilowatt rating. Thus, a single spare unit can be quickly put into service in any location.

2. The control panels have been made more accessible and easier to test and service. Ample room has been provided for purchaser's incoming conduit and wiring. Control components have been selected to permit maximum duplication of devices.

3. The electronic pre-amplifier has been equipped with test points to simplify tube testing and electronic circuit adjustment when required. Only three adjustments are required on the new pre-amplifier as compared with nine on previous designs—one for anti-hunt, one to balance the pre-amplifier and a third to set the maximum operating speed level for a particular section.

The pre-amplifier has been increased in size, made more accessible, is readily removable, and each unit is identical and interchangeable. Tube sockets are all of the industrial type and all connections are of the bolted type for ease of servicing.

4. Control and regulating circuits have been simplified and improved to give better reliability, faster response, more precise speed regulation, and better stability.

5. The new drives offer the maximum in operator's convenience, and this factor alone is important in attaining higher production.

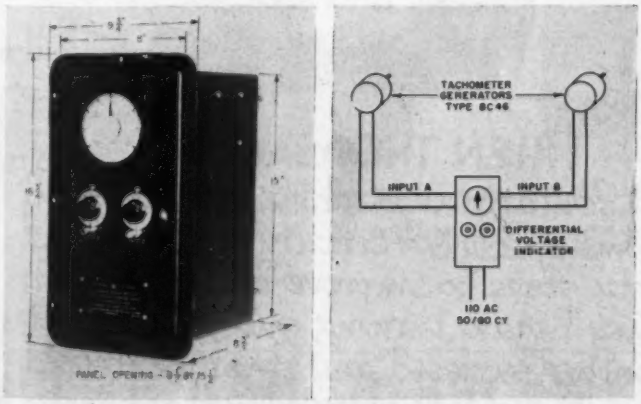


Fig. 6—Differential speed (draw) indicator (left) indicates and can be arranged to continuously record the differential in speed between any two sections of the paper machine in feet per minute

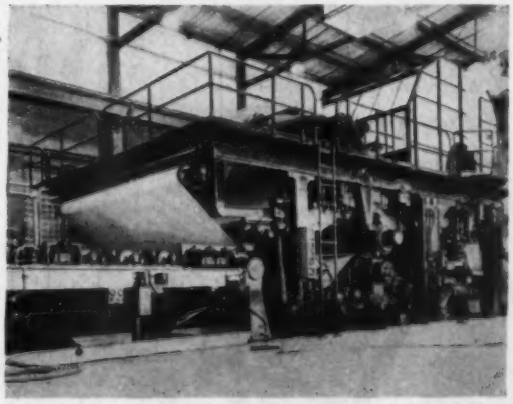


Fig. 7—Yankee paper machine with a characteristic 12-foot dryer; this machine is driven by a multiple generator electronicamplidyne drive

PAPER SKETCHES

FIRST to make fine white paper in England were French immigrants from Casteljaloux, Thiers and Angoulême who set up their mills in London about 1685.

AN UNUSUALLY fine light paper made of chemical wood pulp is being used for the revised standard version of the Bible. This paper, when printed, calipers 1100 pages to the inch, is said to be tough enough to withstand several generations of ordinary use..

..

IN SOME ENGLISH handmade-paper mills of the early 1800's it was the duty of woman employees to search out knots in paper hung up to dry and remove these knots before the sheets were rubbed and sized - - - - -

Rod Ruth

OUCH! WHEN THEY SAW the newly invented fourdrinier machine in successful operation, many early 19th century papermakers took hasty steps to improve their product - - - They began turning out paper that was smoother surfaced and finer textured than any they had ever before produced.

you should see samples of accepts and rejects from Bauer CENTRI • CLEANERS

As you probably know, we have acquired patent and manufacturing rights on cyclonic pulp cleaners from The Hammermill Paper Co. and The Howard Smith Paper Mills, Ltd.

Briefly, a Centri•Cleaner is a cone with a tangential inlet near the top. Pulp slurry of about 0.5% consistency enters the cone under pressure. A whirling motion is imparted to the slurry. Dirt is emitted from the bottom opening, while the cleaned pulp is ejected from the outlet at the top. See the accompanying drawing.

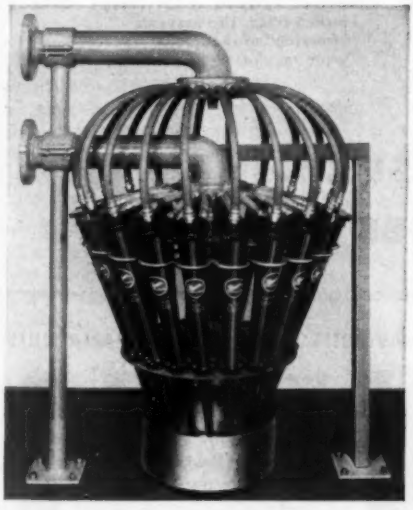
The astonishing fact is that Centri•Cleaners not only remove sand and grit, but also bark particles, fiber aggregates, and shives. In other words, Centri•Cleaners are "sensitive" to alien matter which is of different specific gravity, specific surface, shape, or size than pulp fibers. No other pulp cleaner has that aptitude.

You can see the proof of Centri•Cleaner work in hand sheets which we'll be glad to show you. These are samples of both commercial and laboratory results. The exhibits are amazing.

Write today for our Centri•Cleaner Bulletin No. P-4. It gives detailed information. A limited supply of samples on various pulps is available for mailing. The Bauer sales engineer in your territory can show you a complete brochure of sample accepts and rejects.

This is a highly important subject. We are sure you'll want the details on it.

Impressionistic drawing of the flow in the Centri•Cleaner.



A 20-unit battery of Bauer No. 600 Centri•Cleaners (Hammermill type) in circular arrangement, all connected to single inlet and outlet manifolds.

An installation of Bauer No. 622 Centri•Cleaners (Howard Smith type) handling pulp slurry from knotters. Note that five are hooked up together in the primary group for the first pass. A single one handles the second pass; that is, it reworks the rejects from the primary group. Capacity of this compact assembly of Centri•Cleaners is 250 tons per day.

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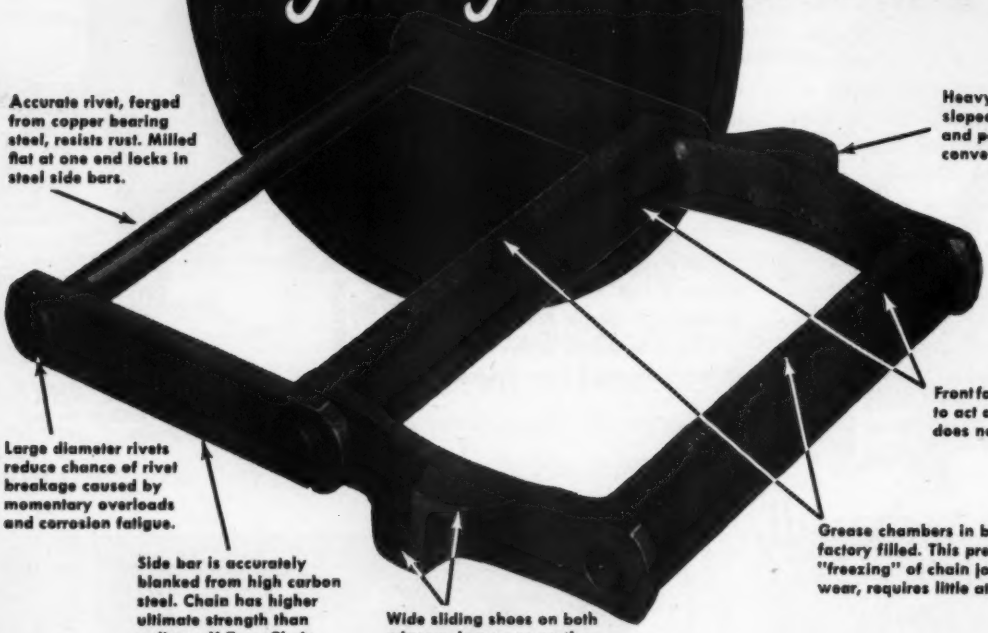
it's stronger.. it lasts longer... it gives you better service!


Accurate rivet, forged from copper bearing steel, resists rust. Milled flat at one end locks in steel side bars.
Heavy wearing shoes are sloped to avoid catching and possible damage to conveyor.
Front faces of barrels designed to act as scrapers. Material does not pack in the trough.
Large diameter rivets reduce chance of rivet breakage caused by momentary overloads and corrosion fatigue.
Side bar is accurately blanked from high carbon steel. Chain has higher ultimate strength than ordinary H-Type Chain.
Wide sliding shoes on both edges reduce wear on the chain and trough.
Grease chambers in barrels are factory filled. This prevents "freezing" of chain joints, reduces wear, requires little attention.

NEW REX* COMBINATION-TYPE REFUSE CHAIN HAS OUTSTANDING ADVANTAGES

Here's the finest chain for conveying sawdust, refuse, wood chips and similar material.

Rex *Combination-Type* Mill Chain is designed to handle assignments that prove too tough for ordinary H-Type Chain.

Check the captions. Each one points out an important reason why this new chain will give you longer service . . . better service . . . and lower overall costs. What's more, it can easily replace corresponding H-Type Chain, since it operates efficiently over the same sprockets and in the same trough.

For all the facts on this new chain, write to Chain Belt Company, 4714 W. Greenfield Ave., Milwaukee 1, Wisconsin.

OTHER REX FAVORITES IN THE PULP AND PAPER MILLS

Rex H-Type Chain — Rex Steel Chabelco* Chain — Rex Log Haul Chain — Rex Durobar* Combination Chain — Baldwin-Rex* Roller Chain

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CHAIN BELT REX COMPANY ®

PULP MILL CHAINS

The Paper Industry Association News

PRESENTATION of the first Fred C. Boyce student award goes to Charles Elliott during a recent meeting of the Michigan Division of the Superintendents Association. Others in the picture are (l to r) Dr. Alfred H. Nadelman, Raymond Barton, and George Kohrman

Roy Kelly Honored in Award Meeting of Michigan Supts.

Roy H. Kelly, resident manager of Marathon Corp. at Rothschild, Wis., was given a surprise tribute at the September 18 meeting of the Superintendents Association's Michigan Division. The honor also benefited the pulp and paper technology curriculum of Western Michigan College by $1,000.

The gathering, which was held at the Hotel Harris in Kalamazoo, also featured the first presentation of one of the Association's three annual scholarships. The award went to Charle Elliott, a junior at WMC. Harvey Hartman of American Box Board Co., chairman of the division, presided at the meeting.

Fred C. Boyce, Milwaukee, one of the founders of the national association, was to have been present to make the two awards. However, illness prevented his attending. Acting in his stead was Raymond L. Barton of Michigan Paper Co., who is a national trustee. He read the text that Mr. Boyce had prepared.

"In recognition of this American and our good friend," Mr. Boyce had written of the Marathan manager, "I present a gift of $1,000 in the name of D. J. Murray Mfg. Co. to Western Michigan College for use in its program of research for the pulp and paper industry, as a manifestation of the good will of the American Pulp and Paper Mill Superintendents Association. . . ." Mr. Kelly made the presentation of the financial gift to the college. It was accepted by Dr. George Kohrman, a member of the administrative council of the school and director of the college's vocational education and practical arts.

Young Elliott won the distinction of being the first student in a pulp and paper technology curriculum to receive the Fred C. Boyce student award. There will be three of these made annually in the United States. One is to be at Western Michigan, one at the University of Maine, and the third at Syracuse. They carry $200 cash and go to students in the field who have maintained a high level of scholarship in the sophomore year and intend to continue in their studies.

Kelly, Boyce given memberships

Another round of awards came when James Wynn of the WMC paper curriculum honored Mr. Kelly and Mr. Boyce with memberships in the student papermakers club, P'si Lun, named in recognition of the first Chinese papermaker. The award to Mr. Boyce was accepted by Grover Keeth of Marathon, who acted as proxy. Mr. Keeth was one of three former national presidents who attended the meeting, the others being Mr. Kelly and Glenn Sutton, Sutherland Paper Co.

Presentation of a technical paper on Slitting and winding fundamentals was made by E. J. Ward of Cameron Machine Co., Camden, N.J. He utilized a series of colored transparencies. Also appearing on the program were O. W. Callighan of Edgar Bros. Clay Co.; R. L. Eminger of Miamisburg, Ohio, former national secretary-treasurer, and Dr. Alfred H. Nadelman, head of the WMC pulp and paper technology curriculum.

Corrosion and Personnel Problems Discussed by Northwestern Supts.

GREAT REDUCTION of losses due to corrosion is now possible through the use of plastic coatings such as vinyl, styrene, phenolic, and silicone resins, as well as chlorinated rubber, according to R. R. Kelly of Progress Paint Co., Wausau, Wis. Mr. Kelly spoke at the fall meeting of the Northwestern Division of the Superintendents Association, which was held September 12 and 13 at Green Bay.

Protection of metals and masonry from corrosion and weathering, protection of products from contamination, better control of slime and dirt in pipe lines, and reduction of heat losses are among the advantages gained by using plastic protective coatings in the pulp and paper industry.

When selecting a plastic coating for any particular application certain detailed information must be given to the coatings' manufacturer to enable the latter to recommend what type of coating is best suited for this job. Among the information required by the manufacturer is the following: (1) surface to which the coating is to be applied, (2) use of equipment, (3) type of exposure, (4) concentration of chemicals

involved, (5) whether the equipment is subject to abrasion and (6) temperature conditions.

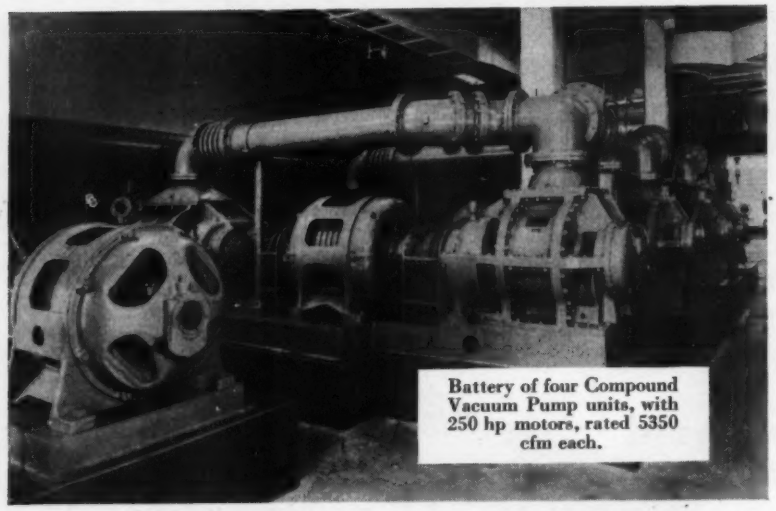
Information which should be obtained from the coatings' manufacturer included (1) application instructions, (2) approximate square-foot costs, (3) approximate film-thickness required and (4) anticipated life of coatings.

Film thickness is an exceedingly important factor and should always be specified in any coatings job, said Mr. Kelly. Experiments have shown that the probability of failure is quite high with film thicknesses of less than three to five millimeters.

Preparation of the surface is the next step in any coatings application job. This involves the removal of all foreign material and a certain amount of roughening to increase surface area and mechanical adhesion. Sandblasting was recommended by the speaker as one of the best methods of surface preparation.

The application of plastic coatings should be done by specialists to insure complete coverage at specified film thickness and to prevent the appearance of pinholes.

Regular schedules of paint inspection and repair can reduce the cost of protection to about five cents per square foot.



Battery of four Compound Vacuum Pump units, with 250 hp motors, rated 5350 cfm each.

BEFORE YOU BUY *ANY* VACUUM PUMPS CHECK THESE 5 ESSENTIALS

To maintain the quality and quantity of your paper production, your vacuum pumps must rate high when compared to these basic values, which are built into Roots-Connersville equipment. Details are available in our Bulletin 50-B-13 on Cycloidal Pumps for Paper Mill Operation. Send for a copy—or let our engineers work with you in selection of vacuum pumps for your individual needs.

1. **LOW POWER CONSUMPTION**—because units are recommended, either single or compound, to operate at the most efficient point.
2. **NEGLIGIBLE FRICTION LOSSES**—no contact between impellers or impellers and casings.
3. **HIGHER SPEEDS**—permitting direct connection to standard motors, saving first cost, space and weight.
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Development of industrial personnel

It is cheaper and more effective to educate industrial personnel than to enforce efficiency and safety regulations, according to King, Evans, manager of personnel, Marathon Corp., Menasha, Wis.

Chronological age has nothing to do with the ability to learn, said the speaker, but a willingness to learn and a desire to change old habits are the first prerequisites in any education program for adults.

Every possible motivation should be used to develop the urge to learn. Among the most effective measures that will keep industrial personnel interested in an educational program Mr. Evans listed: (1) sincere enthusiasm for this program on the part of top management, (2) a well organized program to suit the particular needs of the plant, (3) procurement of people who want to know how to teach, (4) follow-up programs involving repetition by way of a new approach to the problem.

Results in industrial training are seldom immediate or spectacular, but they are nevertheless always forthcoming and highly worthwhile, concluded Mr. Evans.

Other speakers at the meeting were Don Steinbach, Miles Kimball Co., who stressed the importance of consistency in paper quality as being the primary requirement made by the printers; V. T. Cornelius, secretary-manager of the Lake States Pulp & Paper Manufacturers Association, who discussed and compared the changes in average hourly earnings in the various industries. The per cent increase in average wages over the period 1939-1952 for the paper and allied products industries stands at 168.1 per cent, placing the paper and allied products industries fourth among the 17 major industries listed by the speaker.

Myles W. Reif of Blandin Paper Co. was chairman of the general technical meeting. Problems relating to groundwood, sulphite, and sulphat pulping and papermaking were discussed informally by technical discussion groups.

New officers

Lawrence W. Murthfeldt of Consolidated Water Power & Paper So., Wisconsin Rapids, was elected president of the division during a business session; other officers are Myles W. Reif, first vice chairman; G. K. Klaus, second vice chairman, and John A. McPherson, secretary-treasurer.

Paper Mill Men to Appear on Packaging Institute Forum

Several spokesmen for various phases of the paper industry will appear in discussion groups during the 14th Annual Forum of the Packaging Institute, which is to be held October 20-22 at the Hotel Commodore, New York, N.Y.

MODERN POWER TOOLS were demonstrated recently in connection with a meeting of the CPPA woodlands section at the logging research camp of Fraser Companies Ltd., 43 miles from the firm's pulp mill at Edmundston, N. B. Visitors to the two-day field meeting were welcomed by R. G. McFarlane of Fraser; in charge of the power tool demonstration was T. M. Pond, chairman of Fraser's cutting tools committee

The theme of the general program is "Packaging in the Advancing Atomic Age."

Included on the program are the following: L. K. Burnett of The Ohio Box Board Co., who will speak on "Evaluating Resistance of Ink on Printed Packaging Materials to the Product in the Package;" Lewis R. Ayres of Robert Gair Co., "Evaluating the Resistance of Printing Inks to Dry Rub;" B. A. Gaffney, New Haven Pulp & Board Co., "Evaluating Printability of a Material."

Paper mill men on the board of directors are Walter F. Daley of New Haven Pulp & Board; F. S. Leinbach of Riegel Paper Corp., and J. D. Malcolmson of Robert Gair. Mr. Leinbach is a member of the program committee for the current forum.

Cooperation Stressed at Chicago Tappi

More cooperation between the paper manufacturer and the consumer was stressed by O. H. ("Doc") Runyan as he addressed the September 15th meeting of the Chicago Section of Tappi. Mr. Runyan, field secretary for the Graphic Arts Association of Illinois, Inc., spoke on the topic, "Paper at Work."

Suggesting that joint meetings between papermakers and the ultimate user (i.e., pressmen) would be of invaluable benefit to both, the speaker declared that "the printer and the mill men should know more about each other." He said that whereas to the manufacturer the paper represents the finished product, to the user it is nothing more than the raw material. "The printing industry as a

Another wooden Machine Room Roof continues to give satisfaction

• Schmidt & Ault Paper Company of York, Pennsylvania, knew what a serious maintenance problem they had in the roof over their machine room. Extremely high humidity and temperature in the rooms below made the roof a natural prey to rot and decay.

Starting in 1930, they began replacing the old gypsum roof, section by section, with pressure-treated "Wolmanized"* lumber. After years of satisfactory service, this roof is, according to Mr. Henry D. Schmidt, President of Schmidt & Ault, "... DOING A VERY GOOD JOB. SO MUCH SO THAT WE PLAN TO CONTINUE TO USE 'WOLMANIZED' LUMBER ON ANY OTHER ROOFS OVER ROOMS IN WHICH THE ATMOSPHERE IS INVARIABLY HUMID."

The construction of roof decks, floors and structural members in paper mills calls for the insulating qualities of wood. "Wolmanized" pressure-treatment makes this wood last longer.

Many of your maintenance problems are brought about by the continual presence of heat and humidity. "Wolmanized" lumber can solve these problems. Ask your plant engineer or architect about "Wolmanized" pressure-treated lumber . . . or write for complete information and the folder, "Wood Preservation."

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whole," he continued, "is lacking in the knowledge of paper selection and the methods of making it behave." In this respect, Mr. Runyan added, the mill man doesn't know much about the end requirement.

Mr. Runyan, whose talk inaugurated the section's 1952-53 season, described the paper selection course sponsored by the Graphic Arts Association. As director of this education project, he pointed out, he has seen the great benefit that such a program has to offer in acquainting all phases of the field—from mill to consumer—with each other's needs and problems. The course covers the subject in its entirety, from technical discussions of manufacturing processes to trade terms and proper mill-buyer relationships. Typical examples of difficulties arising between buyer and seller as the result of avoidable misunderstandings were described by Mr. Runyan, who has had 40 years' experience in the paper and printing industries.

Briefly describing the paper selection course, the speaker listed the various topics covered in the educational program. These include the physical characteristics of paper; a review of trade customs and purchasing; methods of testing; the relation of paper to printing plate; gravure, offset and letterpresses, the bindery; differences in pulps and their relation to the end use, and printing qualities. Vance V. Vallandigham, chairman of the section, was in charge of the meeting. Mr. Vallandigham, technical director of the paper department of Kelco Co., was recently appointed manager of research and development for the paper division of Potlach Forests Inc., Lewiston, Idaho.

Coming Events

TAPPI meetings

Oct. 13-16—Seventh Engineering Conference, Morrison Hotel, Chicago.

Oct. 27-28—Fibrous Agricultural Residues Conference, Northern Regional Research Laboratory, Peoria, Ill.

Nov. 5-6—Plastics Conference, College of Forestry, State University of New York, Syracuse.

Nov. 12-14—Sixth Annual Alkaline Pulping Conference, Battle House Hotel, Mobile, Ala.

Nov. 18—Ohio Section (joint meeting with the Miami Valley Superintendents), Middletown, Ohio.

Nov. 20-21—Corrugated Containers Conference, Schroeder Hotel, Milwaukee.

Jan. 28-30—Technical Section, CPPA, Mount Royal Hotel, Montreal, Canada.

Feb. 16-19—Annual meeting, Commodore Hotel, New York, N.Y.

American Pulp & Paper Mill Superintendents Association meetings

Oct. 23—Miami Valley Division, American Legion Hall, Middletown, Ohio.

Nov. 18—Miami Valley Division (joint meeting with the Ohio Section of Tappi), American Legion Hall, Middletown, Ohio.

June 9-11—National meeting, Atlanta-Biltmore Hotel, Atlanta, Ga.

Other meetings

Oct. 20-22—Packaging Institute, annual forum, Hotel Commodore, New York, N.Y.

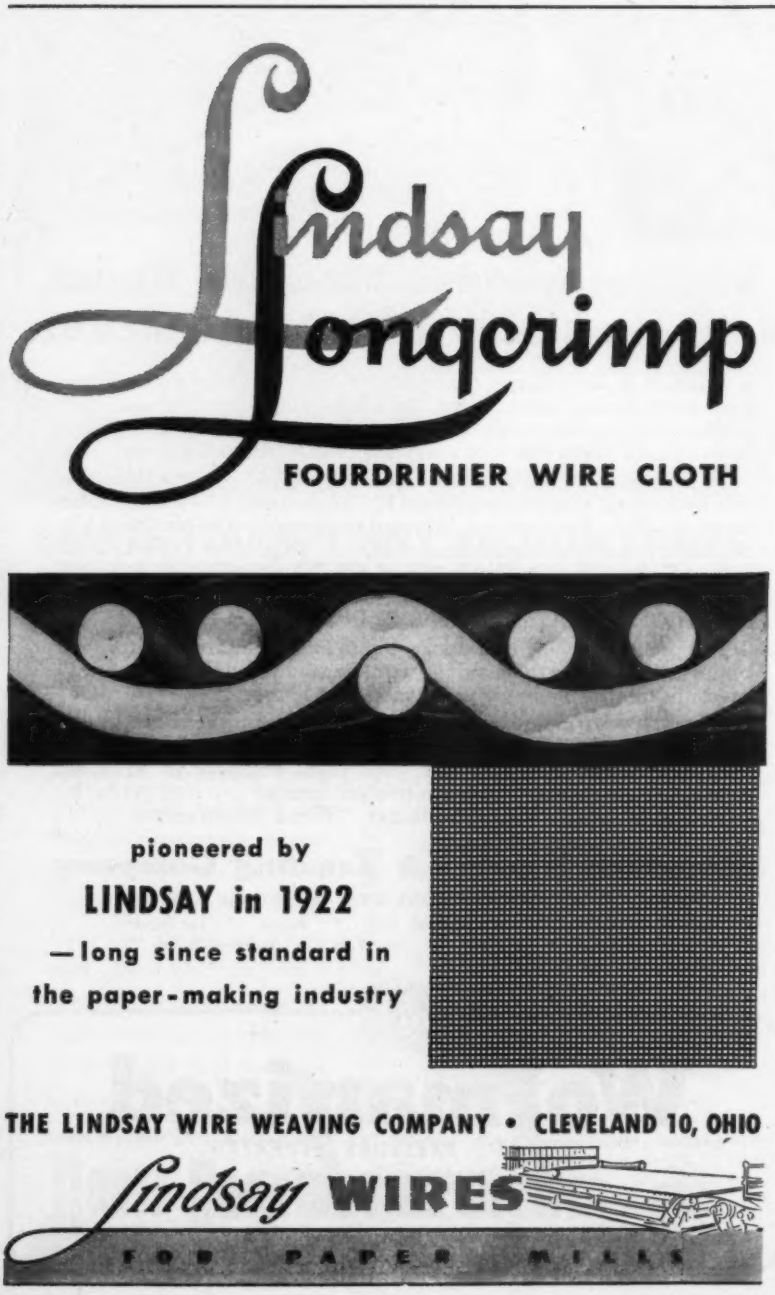
Oct. 20-24—40th National Safety Congress and Exposition, Conrad Hilton Hotel (pulp and paper headquarters at Sheraton Hotel), Chicago.

Oct. 30-31—National Paper Trade Association, fall meeting, Edgewater Beach Hotel, Chicago.

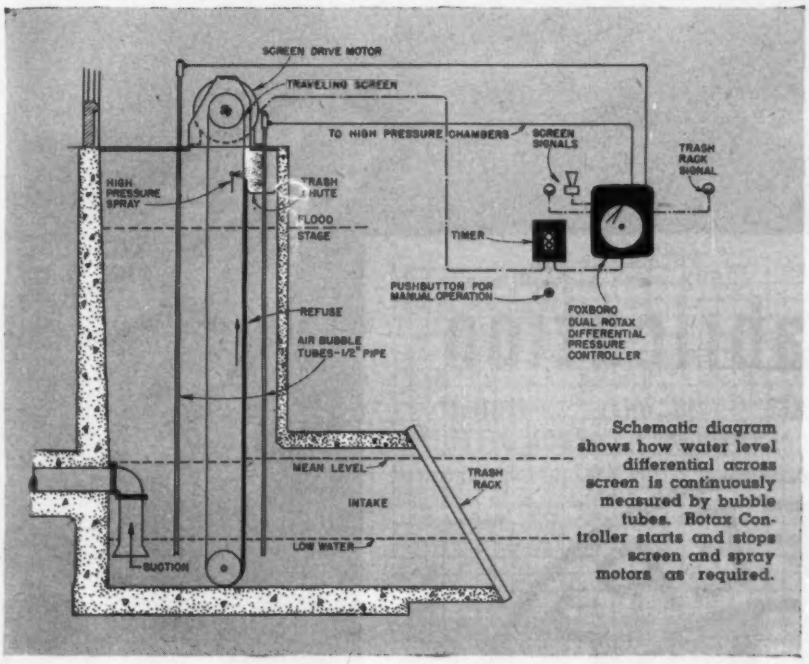
Nov. 5-7—Industrial Management Society, Sixteenth Annual Time and Motion Study and Management Clinic, Sheraton Hotel Chicago.

Dec. 1-6—Twentieth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York, N.Y.

Dec. 7-10—American Institute of Chemical Engineers, annual meeting, Cleveland Hotel, Cleveland.



Make traveling intake screens positively "Plug-Proof"



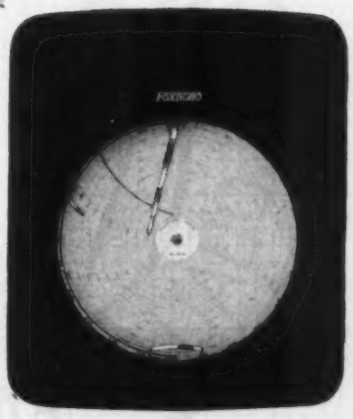
Schematic diagram shows how water level differential across screen is continuously measured by bubble tubes. Rotax Controller starts and stops screen and spray motors as required.

. . . with Foxboro liquid level type screen control

Make sure your intake suction well can't go dry when excessive refuse suddenly piles up on the traveling intake screen!

The Foxboro Traveling Screen Control System automatically starts the screen-rotating motor and the cleansing spray whenever refuse accumulation causes the water level difference between opposite sides of the screen to exceed a certain preset value. Quickly, it purges the screen of refuse and restores the intake level to normal — or sounds an alarm indicating that the cleaning mechanism is unable to cope with the difficulty. What's more, this action takes place only when the screen actually becomes clogged . . . no waste of power or unnecessary wear on mechanism through needless periodic operation.

The Foxboro Traveling Screen Control System is easy to install, inexpensive to operate, and pays big dividends in better intake operation, less maintenance and greater peace of mind. Write for complete information. **The Foxboro Company, 8210 Neponset Ave., Foxboro, Mass., U.S.A.**



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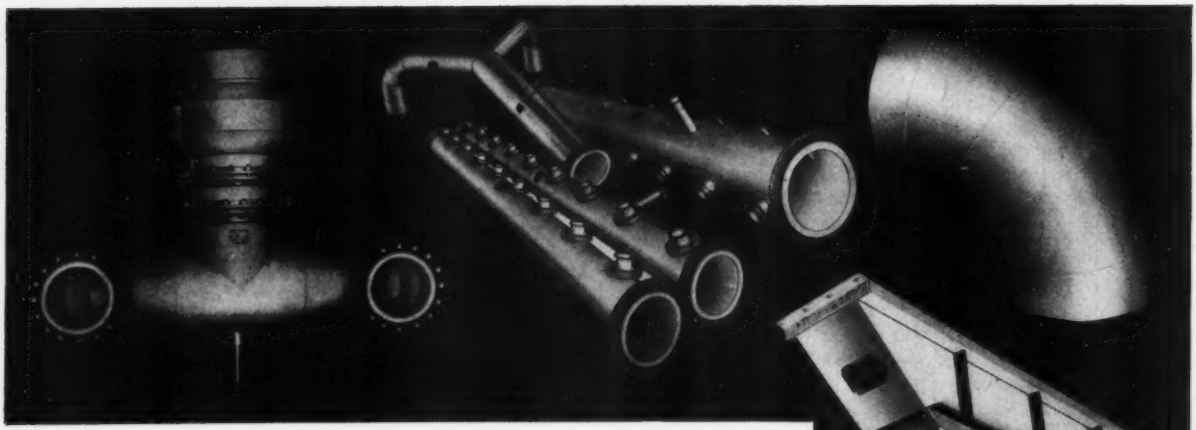

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The Paper Industry Names in the News

Emil Heuser Honored by German Association

EMIL HEUSER, famed cellulose chemist, has been honored by the German Association of Pulp and Paper Chemists and Engineers with the Alexander Mitscherlich Denkmünze, coveted commemorative medal. Dr. Heuser, who was Tappi medalist in 1948, is now living in La Jolla, Cal. He recently passed his 70th birthday.

In addition to bestowing the award on the chemist, the Association devoted an entire issue of its publication, *Das Papier,* to his life and work.

Dr. Heuser was awarded the degree of Doktor Ingenieur in 1909. His training was practical as well as academic, since early in life he had first-hand experience in German and Austrian mills. In 1912 he came to the Technical University at Darmstadt as professor of cellulose chemistry. He was made honorary professor of cellulose chemistry at the Technical University at Charlottenburg in 1923.

Soon thereafter he became director of research for Canadian International Paper Co. at Hawkesbury, Ont. In 1938 Dr. Heuser was made group leader of cellulose chemistry at the Institute of Paper Chemistry, Appleton, Wis. He was emeritized in 1947.

Dr. Emil Heuser

Colin Gardner III

Colin Gardner III Appointed To Wage Stabilization Board

Colin Gardner III, vice president of Gardner Board & Carton Co., Middletown, Ohio, has been appointed to the government's Wage Stabilization Board by President Truman. He is one of six members representing industry. Mr. Gardner is also vice president of Dairypak Inc., Cleveland, Ohio, and member of the board of directors of Manchester Machine Co., Middletown, Ohio.

Hayward Resigns From KVP; Joins Kalamazoo Label Co.

JOHN M. HAYWARD, son of the late Ralph A. Hayward, who has been in the planning and control department of Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich., of which his father was president, has resigned to accept the position of assistant general manager of Kalamazoo Label Co. He will be aide to James J. Murray, president and general manager of the company.

J. M. Hayward

V. V. Vallandigham

Vallandigham Joins Potlatch

VANCE V. VALLANDIGHAM has been appointed manager of research and development of the paper division of Potlatch Forests, Inc., Lewiston, Idaho. In his new position, Mr. Vallandigham will be concerned with new developments and technical services and will coordinate production and quality control problems. He formerly was technical director of the paper department of Kelco Co., Chicago. He is in his second term as chairman of the Chicago section of TAPPI.

Three Changes Announced By W. Va. Pulp & Paper

Major administrative changes in the Wood and Woodlands Departments were recently announced by West Virginia Pulp & Paper Co.

M. H. COLLET, formerly assistant to W. J. Bailey, vice president, has been given a new assignment by the company to explore opportunities in Latin America. Mr. Collet's duties will be divided between *D. Y. LENHART,* who has been assistant manager of the company's Southern Woodlands office in Summerville, S.C., and *P. T. LANNAN, JR.,* manager of the company's Westvaco Experimental Forest, near Andrews, S.C.

Mr. Lenhart is appointed general manager of woodlands for the company, with headquarters in the New York office, and has been assigned responsibilities with regard to management activities on company lands and the general pulpwood supply for company mills. Mr. Lannan is appointed technical advisor to the vice president and will administer the Southern, Appalachian and Northeastern forestry and pulpwood research projects of the company.

Chidester to Aid UN Attack On World Paper Shortage

GARDNER H. CHIDESTER, chief of the pulp and paper division of U.S. Forest Products Laboratory, Madison, Wis., left the United States September 13 for Rome, Italy, where he will work with the Forestry Division of the United Nations Food and Agriculture Organization. Mr. Chidester will be on special assignment with the U.N. organization for three months. He has been asked to help FAO consider ways of meeting world-wide need for pulp and paper, particularly newsprint.

Fales Succeeds Hayes At St. Croix

HENRY W. FALES has been promoted from assistant general manager to vice president and general manager of St. Croix Paper Co., Woodland, Maine, succeeding Harry Hayes, who retired as of August 1.

Mr. Fales, who is a native of Thomaston and a graduate of the University of Maine, joined St. Croix in March 1951 as assistant general manager. In 1935, after graduating from college, he joined Scott Paper Co., Chester, Pa., and six years later was transferred to Marinette Paper Co., where he served as plant engineer. He became plant manager in 1942 and in 1945 was appointed plant

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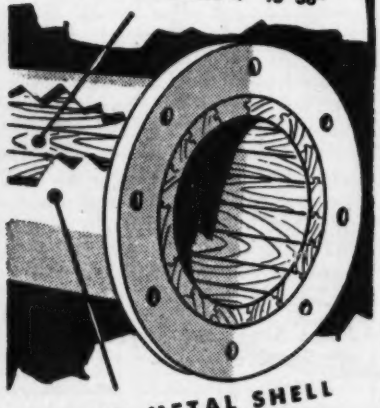

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engineer for the mill at South Glens Falls and the Fort Edwards mill of this company. He served as general superintendent of the two mills from 1948 to 1950, when he became chief engineer of Wood Flong Corp., Hoosick Falls, N.Y.

Scott Names Armstrong Personnel Manager

ARTHUR F. ARMSTRONG has been named personnel manager for Scott Paper Co.'s West Coast Operations and will make his headquarters in the offices of the Soundview Division pulp mill at Everett, Wash. He will be responsible for the administration of the personnel program there and at the Empire, Ore., and Ancortes, Wash., mills of Coos Bay Pulp Corp., a Scott subsidiary.

A graduate of the University of Toronto, Mr. Armstrong joined Scott's Chester, Pa., plant as a personnel trainee in 1936. He later did sales work and in 1947 was appointed supervisor of employment and training. He became Chester plant personnel manager in 1949. In 1951 he became staff manager of employment and personnel development.

KARL A. OBERREICH has been appointed sales manager of Appleton Woolen Mills, Appleton, Wis. Mr. Oberreich joined the company in 1949 and has had 22 years exprience in the paper field, including technical and research work, purchasing and selling.

K. A. Oberreich

R. G. Ruark

ROBERT G. RUARK has been appointed executive assistant to the president of Corn Products Refining Co. He joined the company in 1944 as director of sales research for the Chemical division and in 1948 was named assistant general manager of the chemical division.

Fibreboard Products Inc. recently elected *WILLIAM L. KEADY*, president of Pabco Products Inc., and *B. P. ALTICK*, vice president in charge of sales of Fibreboard Products, members of the board of directors.

Among 34 business leaders appointed to the Manufacture Department Committee of the Chamber of Commerce of the United States are: *MELVIN H. BAKER*, chairman, National Gypsum Co., Buffalo, N.Y.; *H. G. BOON*, vice president in charge of manufacture, Kimberly-Clark Corp., Neenah, Wis.; and *LEROY A. GRETTUM*, vice president and general manager, Pusey & Jones Corp., Wilmington, Del.

THOMAS B. McCABE, president of Scott Paper Co., Chester, Pa., has been named chairman of an advisory committee to the Citizens Committee for Eisenhower and Nixon in Eastern Pennsylvania.

J. BERGER REIMER, vice president of Berwyn T. Moore & Co., investment brokers of Louisville, Ky., has been elected to the board of directors of Doeskin Products Co., New York City.

GEORGE J. TOOKER has been appointed division manager of the Natick, Mass., boxboard division of Robert Gair Co. Inc. Mr. Tooker, who joined the company in 1941, formerly was technical advisor to the boxboard division.

G. J. Tooker

W. H. Steinkamp

WILLIAM H. STEINKAMP has been appointed vice president and general sales manager of Beckman Instruments Inc., South Pasadena, Calif. Mr. Steinkamp previously was general sales manager of the Brown Instruments Division of Minneapolis-Honeywell Regulator Co., Philadelphia, Pa.

ALFRED L. ALK has been appointed assistant technical director of Clopay Corp., Cincinnati, Ohio.

J. LESLIE SENSENBRENNER, assistant secretary-treasurer of Kimberly-Clark Corp., Nenah, Wis., has been named a director of First National Bank of Neenah, filling a vacancy created by the death of his father, F. J. Sensenbrenner.

Central Michigan Paper Co. recently announced the addition of four men to the board of directors: *CHAUNCEY TODD, FRANK SWEET, MAX HENSICK*, and *STERLING BARBOUR*.

Southern Division of International Paper Co. has announced the promotion

of the following men in the division office at Mobile, Ala.: *ARTHUR L. ROSS* to assistant general manager of the Southern Kraft Division; *C. L. CRAIN*, assistant production manager, to production manager, succeeding Mr. Ross; and *GEORGE T. WARD*, chief enginer since 1945, to full charge of all engineering, construction and power.

Crystal Tissue Co., Middletown, Ohio, has announced the promotions of *JOHN B. TRIMBLE* and *JOSEPH E. BLASHOCK* to paper machine superintendent and tour foreman, respectively. Mr. Trimble has been with the company 30 years and Mr. Blashock, 24 years. Both men started as machine tenders.

LOUIS B. TAYLOR has been appointed to the market research and development department of Columbia-Southern Chemical Corp., where he will specialize on work related to the pulp and paper industry. Prior to joining the firm in 1939, he served the Institute of Paper Chemistry as a technical assistant.

GEORGE M. BURRUS has been elected vice president in charge of board sales and public relations of United Board & Carton Corp. He previously was assistant to the president.

Hammermill Paper Co., Erie, Pa., has announced the promotion of three maintenance division supervisors. *CHARLES COFFEY*, foreman in the millwright department, was promoted to general foreman of construction; *WALTER EGER* and *GEORGE BARRON*, both assistant foremen, were promoted to millwright department foremen.

JOSEPH P. MADDEN, assistant sales manager of Stauffer Chemical Co., New York, has resigned to become vice president and a director of Caldwell Chemical Co. Inc.

J. P. Madden

J. W. Couture

J. W. COUTURE has been promoted to the position of Northeastern sales manager of Black-Clawson Co., Hamilton, Ohio. He will represent and supervise the sales of the products of all divisions of the company. He came to Dilts in 1939 as a draftsman and a year later was promoted to chief Engineer. In

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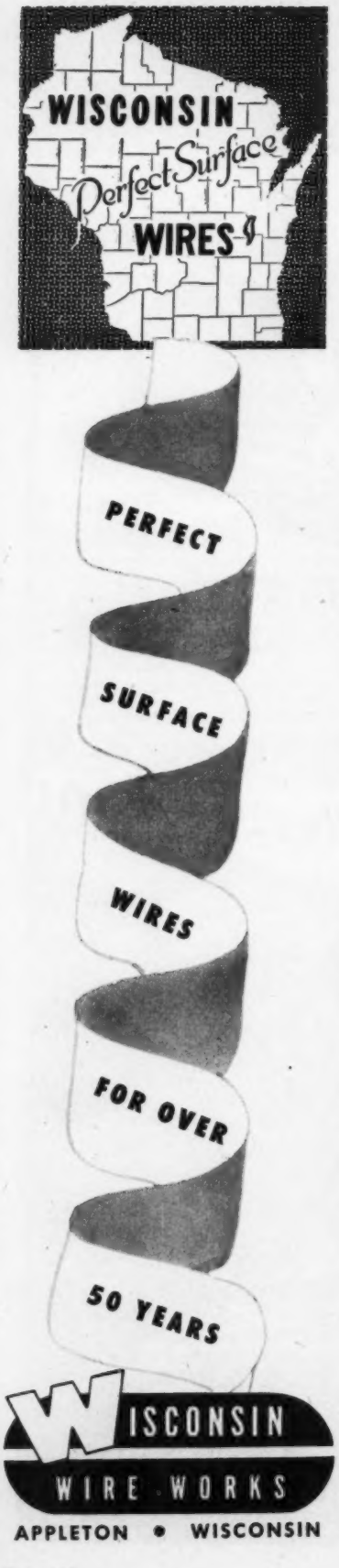

recent years he supervised the production engineering of a new line of paper and plastics converting machinery.

CHARLES E. OLSON JR., 1952 University of Michigan graduate, has been awarded the Minnesota & Ontario Paper Co. $1,500 graduate research fellowship in forestry. Mr. Olson will do his graduate work at the University of Minnesota. He will investigate the regeneration status of cutover upland spruce, balsam and hardwood forest types in the vicinity of Big Falls, Minn.

J. F. MacKELLAR, vice president and general manager of Ontario-Minnesota Pulp & Paper Co. Ltd., has been made a member of Minnesota & Ontario Paper Co.'s executive research committee, which formulates over-all research policy and considers and approves all research projects.

At a convention of the Catholic Order of Foresters, held recently at Ironwood, Mich., *FRED KLAUS*, of Menominee, Mich., was re-elected trustee, and *ALPHONSE NAULT*, of Nadeau, Mich., was re-elected treasurer of the upper peninsula unit.

ERNEST A. CRAWFORD, engineering supervisor of Continental Paper Co., Ridgefield Park, N.J., has been selected president of the Bergen County Chapter of the New Jersey Society of Professional Engineers.

Howe Scale Co., Rutland, Vt., has appointed three new branch managers. *DONALD P. BERNE*, formerly sales representative at the Cincinnati Branch, has been promoted to Minneapolis branch manager; *WILLIAM J. TUCEY* has been made San Francisco branch manager, replacing *LIERD E. GRANT*, who was appointed Los Angeles branch manager.

Sandoz Chemical Works, Inc. has appointed *E. P. McGINN* head of its new paper division. Mr. McGinn had been industrial editor of *Paper Trade Journal* since 1947. Prior to that, he was sales-service engineer for Sutherland Refiner Corp. and chief chemist of the Paper Chemicals Division of Nopco Chemical Co.

HOWARD W. WITT, former personnel manager of Marinette Paper Co., Menominee, Mich., has been made personnel manager of Scott Paper Co., Chester, Pa. He will be succeeded by *GEORGE CLOSSAY*, personnel manager at the company's Fort Edward, N.Y., plant. Mr. Witt, who joined Marinette in 1947, was formerly located at Chester as publicity supervisor and prior to that time was district sales manager for Scott at Cleveland, Akron, and Canton, Ohio. Mr. Clossay has been associated with Scott since 1945, becoming district industrial sales manager in Worcester, Mass., in 1947 and personnel manager of the Fort Edward plant in 1951.

WILLIAM J. THOMAS, general sales manager of the Tubular Products division of Babcock & Wilcox Co., Beaver Falls, Pa., has been named to the board of directors of the division. He has been with the company since 1932 and with the Tubular Products division since 1941.

Samuel M. Langston Co. has appointed *E. B. SEEGER* assistant sales manager and *EDWARD CARTER* controller. Mr. Seeger joined the company in 1945. Mr. Carter formerly was assistant works accountant at the Philadelphia plant of General Electric Co.

HAROLD F. FOGMAN has been appointed sales representative for the steel strapping division of The Stanley Works, New Britain, Conn., in the states of Washington and Oregon, with headquarters in Seattle.

H. F. Fogman

V. L. Johnson

VERNON L. JOHNSON, associated until recently with Studebaker Corp., has been appointed a regional sales manager for the Industrial Truck Division of Clark Equipment Co. He has been assigned the northeastern region and will headquarter in New York, N.Y.

SHERMAN VALENTINE, for many years manager of St. Regis Paper Co.'s Harrisville mill, will undertake special survey and project work in connection with New York state wood supply. Succeeding Mr. Valentine as manager is *L. J. SMITH*, who was with St. Regis at Kalamazoo several years ago and has since been manager of the Gould Paper Co. mill, Lyons Falls, N.Y.

B. PRATTE was recently appointed general sales manager of Harnischfeger Corp. He had been sales manager of the company's Pittsburgh office since October 1946.

W. A. FINN has been named assistant general sales manager of Worthing-

ton Corp., Harrison, N.J. Mr. Finn, who previously was general European manager in Paris, will make his new headquarters at Harrison.

TOM R. MOORE has been appointed assistant to the vice president and general sales manager of General Dyestuff Corp., New York. He formerly was sales service manager for the Antara Chemicals Division of General Dyestuff.

Two members of the staff of the Camas division of Crown Zellerbach Corp. have been transferred to the San Leandro, Calif., plant. *EARL EBAUGH*, a foreman in the napkin department, has been appointed a production supervisor at the California plant. *R. W. KIRSEKORN* will be head mechanic at San Leandro.

Seven employees of the National Pole Treating division of Minnesota & Ontario Paper Co. were presented 25-year service rings at a luncheon held recently at the division's dining hall. The seven new members of the Old Timers Club are: *MICHAEL F. FLOR, ARTHUR C. BUBOLTZ, ALVIN TAUER, CLIFFORD COCHRANE, GUY TILLESKJOR, LEON WELLMAN,* and *JOHN V. WESTLING.*

Jeffrey Manufacturing Co., Columbus, Ohio, has named *C. W. HAWLEY*, formerly sales manager of the products engineering division, manager of original equipment sales, merchandise division. Replacing Mr. Hawley as sales manager is *LESTER L. GROOMS*, who previously was an engineer for the chain sales division.

WAYNE SMITH, production manager of Crossett Paper Mills, Monticello, Ark., was the principal speaker recently at the Engineer's Day Convention at Arkansas A & M College.

ALEX REIKES has been appointed to succeed John N. Daniels as manager of the San Francisco branch of Graton & Knight Co., Worcester, Mass. Mr. Reikes has been transmission engineer at the home office for the past two years. Mr. Daniels has resigned because of ill health.

EDWARD L. NORTON, president of Coosa River Newsprint Co., Coosa Pines, Ala., has been elected to the board of directors of Nehi Corp., Columbus, Ga.

WILLIAM W. CAMPBELL JR., who has been a manufacturing, selling and servicing executive of Lockport Felt Co. for 17 years, has been promoted to sales manager, filling the position formerly held by the late Bertram A. Audley.

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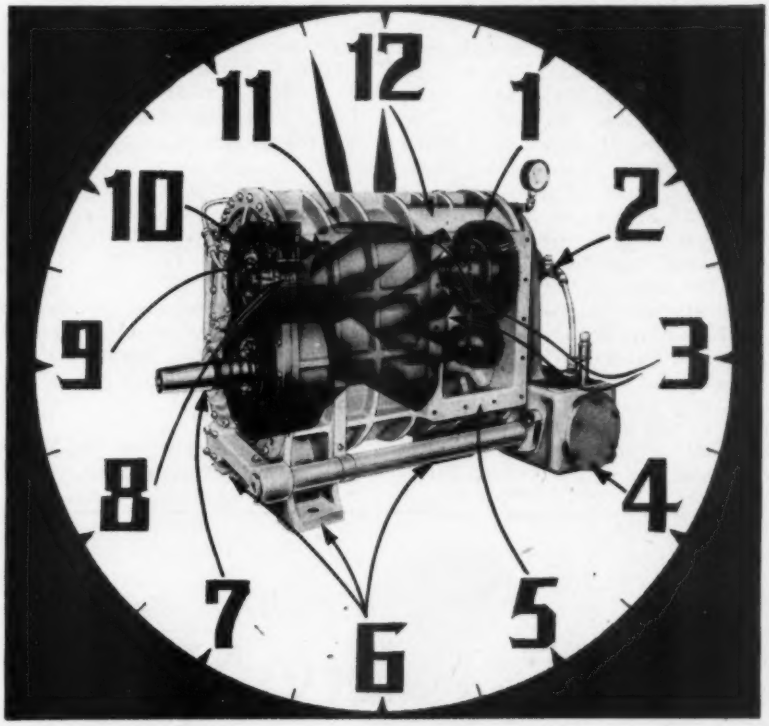

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The Paper Industry Necrology

Chauncey E. Cole

Chauncey E. Cole, 64, former superintendent of Mutual Box Board Co., Utica, N.Y., died August 7 at his home in Utica. A veteran of the paper industry for the past 36 years, he had previously been associated with Cincinnati Paper Board Co., Crescentville, Ohio; Chesapeake Corp., West Point, Va.; Harriman Co., Harriman, Tenn.; John H. Heald Co., Lynchburg, Va.; Fraser Co. Ltd., Edmundston, N.B.; Fraser Paper Co., Madawaska, Me.; Haverhill Box Board Co., Haverhill, Mass., and Chesapeake Paper Board Co., Baltimore, Md. He joined Mutual Box Board in 1946. He was chairman of the New York-Canadian Division of American Pulp and Paper Mill Superintendents Association.

Harry C. Parks, 84, treasurer of Robert Gair Co. prior to his retirement in 1928, died August 1 at Chicago, Ill.

Joseph L. Seiler, 86, retired vice president of Riegel Paper Corp., New York, died recently in East Orange, N.J., following a long illness.

Howard O'Brien, 77, of Grand Rapids, Mich., former executive of River Raisin Paper Co., Monroe, Mich., died July 27 in London, England, where he was vacationing.

Otto L. Koehn, 60, treasurer and comptroller of Upson Co., died August 6 in a Lockport hospital. He had been with the Upson Co. 32 years.

William C. Greenough, an electrical engineer who was associated with W. H. Smith Paper Co., Albany, N.Y., for many years, died suddenly July 31 while on a business trip.

John W. Hewitt Sr., 72, president of J. W. Hewitt Machine Co. and former executive of Hewitt Transmission Co., Neenah, Wis., died August 2 in a Madison hospital.

Reuben L. Moss, 73, retired secretary-treasurer of Atlanta Paper Co., died July 25 at a hospital in Atlanta, Ga.

Jack H. Newman, 59, of Aurora, Ill., died July 26 in a Chicago hospital. He was vice president of Midland Paper Co., Chicago, Ill.

W. Vernon French, senior director of Thames Board Mills Ltd., Purfleet, England, passed away suddenly August 1. A veteran paperboard man, Mr. French was in charge of purchasing, costing and accounting for the firm.

Max Oberdorfer, 72, of Portland, Ore., president of St. Helen's Pulp & Paper Co., St. Helen's, Ore., died July 26.

Harry H. Hughes, 63, of Jersey City, N.J., general manager of Price & Pierce Ltd., New York City wood pulp concern, died suddenly July 27.

Robert Grant, 63, vice president of Parsons & Whittemore Inc., New York, N.Y., pulp and paper merchants, died September 21.

The Paper Industry Safety News

Speakers Named for National Safety Congress

Principal speakers for sessions of the Pulp and Paper Section of the National Safety Congress were named late in September. Meetings of the section will be at the Sheraton Hotel, Chicago, October 20 through 23. (For the complete program, see the September issue of THE PAPER INDUSTRY.)

Speaking at the opening session at 2 p.m. Monday will be G. W. E. Nicholson, vice president in charge of manufacture for Union Bag & Paper Corp., New York, N.Y. The subject of his address is to be "Management and Safety." Also scheduled for the lead-off meeting are the progress report, to be given by General Chairman H. B. Goodrich; the report of the nominating committe by J. Fred Berry, personnel manager for Alton Box Board Co., and the election of 1952-53 officers.

Three speakers for the 2 p.m. session Tuesday have been named by the pulp and paper section. They are: D. D. McRae, assistant secretary-treasurer of Ontario-Minnesota Pulp & Paper Co. Ltd., whose subject will be "The Workmen's Compensation Board and You;" Allen L. Cobb, director of safety and fire prevention for Eastman Kodak Co., "Fire Prevention in the Paper Industry," and R. W. Gray, safety director for Union Bag & Paper Corp., "Unusual Accidents."

One of the highlights of the program will be the presentation of the Edward Benton Fritz Trophy, given annually by THE PAPER INDUSTRY to the mill with the best safety record for the year. Making the award will be A. Scott Dowd, president of Fritz Publications Inc., Chicago.

As in past years, two afternoons will be devoted to panel discussions on different phases of safety in the paper industry. On Wednesday at 2 p.m. round tables will be staged for those interested in sulphite pulp manufacturing, sulphate pulp manufacturing and paper converting. At 2 p.m. on Thursday the subjects for discussion will be paper manufacturing, pulpwood logging and insulation products.

International's Northern Div. Shows Gain in Safety Record

For the first six months of 1952, the average frequency rate for the six mills in International Paper Co.'s Northern Division was 4.75, an improvement of 35 per cent over the corresponding period last year. (The mills involved are as follows: York Haven, Niagara, Hudson River, Otis Division, Tonawanda, Ticonderoga.) The rate is the lowest in the history of the firm.

By way of comparison, according to the U.S. Bureau of Labor Statistics, the frequency rate for pulp and paper mills was 15.6 for the year 1951 and 15.3 for the first four months of this year.

For the six units the total man-hours was 5,478,998, with 26 injuries recorded. The figures for the same period last year were 5,473,915 and 35, respectively. The frequency rate in 1951 was 6.39.

The Executive Committee of the National Safety Council's Pulp and Paper Section will meet during the forthcoming National Safety Congress.

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continuous digester

The mill trials were made in a large kraft mill now using CHEMI-PULPER continuous digesters for producing corrugating board pulp from mixed hardwoods.

Based on a series of trial runs, the operating conditions for the CHEMI-PULPER continuous digester were determined and the operation was placed on a 24-hour basis.

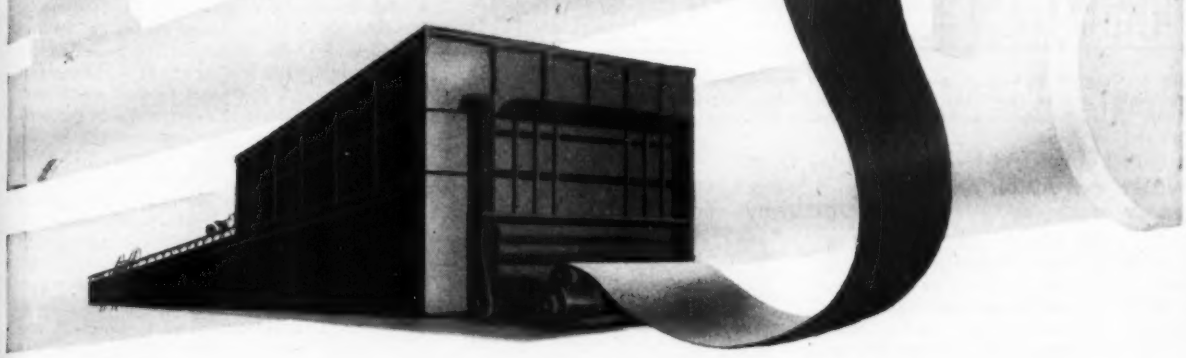
High yield kraft pulp in the 60-62% range was produced from a mixture of spruce and balsam woods. The pulp passed through hot stock refiners—over a vacuum washer—through the board machine disc refiners and onto the liner board machine. The liner board was made from 100% CHEMI-PULPER continuous digester kraft pulp at the usual mill operating speed and tested somewhat higher than the minimum requirements for .016 liner.

The CHEMI-PULPER continuous digester can produce kraft pulp continuously at a considerable *saving in steam and manpower* requirements, and at a *better uniformity* which is an inherent characteristic of a continuous process as compared to a batch operation.

Again, PANDIA INC. with the CHEMI-PULPER continuous digester is first. As a pioneer and developer of the only mill proven continuous pulping equipment, we believe that this commercial run marks the first time on this continent that kraft pulp has been produced continuously on a 24-hour basis and run out into liner board.

Whatever your need, a PANDIA engineer will gladly confer with you regarding your particular problem.

Bulletin upon request.



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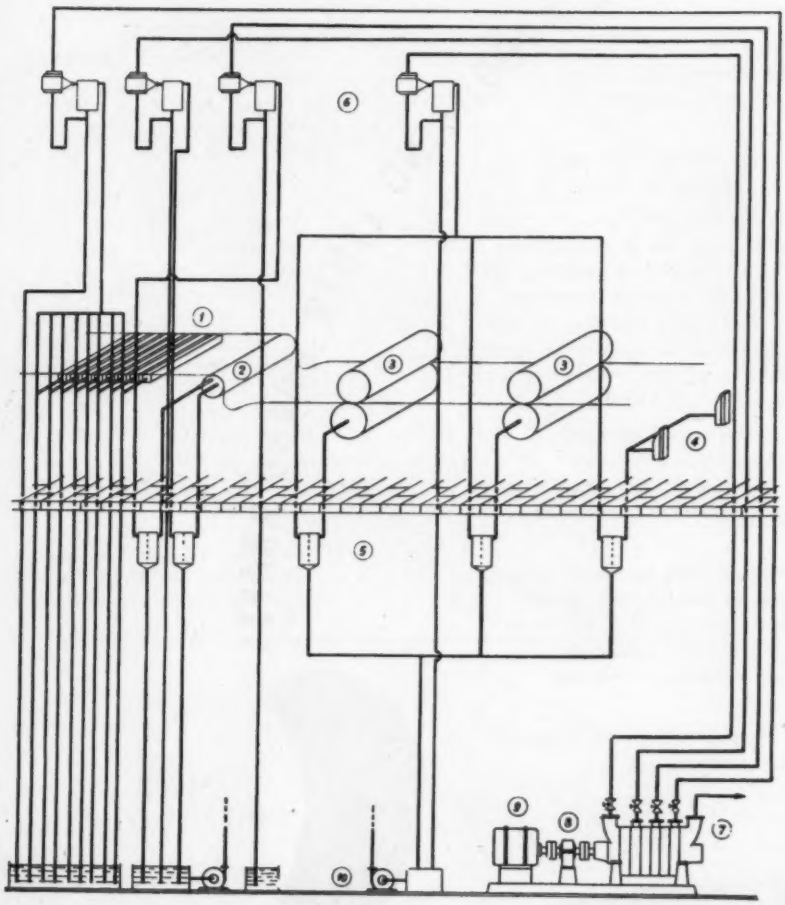

Fig. 1—Diagram of vacuum plant with turbair blower showing: (1) wire suction boxes; (2) double-box suction couch roll; (3) felt suction press roll; (4) vickery shoes; (5) main separators; (6) drop separators; (7) turbair blower; (8) step-up gear; (9) driving motor; (10) pumps

Water extraction on paper machines

The author gives a full description of the (Swiss) Sulzer turbair blower, which has been installed mainly in Swedish, English, French and Italian paper mills. The diagram of the installation of such a blower is shown in Fig. 1. The turbomachine replaces water ring pumps. The former has a considerably higher adiabatic efficiency and, as a result, permits a saving of 30 to 60 per cent in power output. Furthermore, the heat of the blower can be employed at the dry end of the machine, which improves the over-all heat balance. Nearly the entire energy of the blower can be recovered, which permits a possible rapid "writing off" of the initial costs.

The blower is an open heat pump, drawing cold air from the suction boxes and suction rolls and expelling it in the hot state into the dryer section. The use of such blowers depends on highly effective cyclone water separators, which permit separation of air and water between the suction points of the paper machine and the blower. Various advantages of the Sulzer blower are discussed. Robert Thomann. *Svensk Papperstidn.*, 55, 453-459 (1952). (In English.)

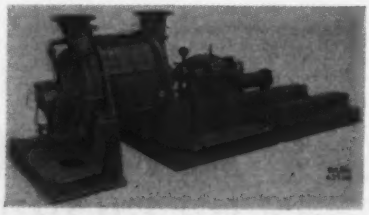

Fig. 2—Sulzer turbair blower KRC Albbruck (PM Voith)

Comparison of various refiners in groundwood pulping

Jordan-type and disk refiners used for screenings from groundwood were compared under mill conditions. Two pulp stocks (one for newsprint and the other used for printing papers) were used and ground in Voith continuous grinders at 1-1.5 per cent consistency and at a pit temperature of 60 deg. Rejects were subjected to a one stage screening process, and the subsequent refining operations included a Voith-Nacke disk refiner *(I)*, a Voith jordan (type 49) *(II)*, which was equipped with steel bars on both cone and shell, and a similar jordan *(III)* in which steel bars were carried on the cone, whereas the shell had a basalt lava lining.

Measurements with *I* included only the correlation between the throughput and the degree of refining (i.e., percentage slivers) and the relation of throughput to the power consumption. Studies made with *II* and *III* include these relationships but also include data on the relation between power consumption and revolutions per minute, and to shell setting.

Of the refiners, *II* showed superiority with regard to a decrease in sliver content and power consumption, and, with increasing rpm and pressure, the percentage slivers decreased. Both *II* and *III* gave appreciable amounts of finestuff (but less than that obtained with *I*). The cost of *II* was less than that of *I* and space requirements were also lower.

The data presented by the authors indicate trends in performance and must be interpreted judiciously. Walter Brecht and Erich Müller. *Das Papier*, **6**, 86-94 (1952). (In German).

Studies on paper wet strength

The preparation of sulphomethylated urea formaldehyde was studied with a view towards its utilization in the production of wet strength paper. The resin contains the group $-CH_2SO_3Na$. Using 1 mole urea, two moles of formaldehyde (and adjusting the pH to 6 by means of ammonium hydroxide), and by adding 0.1 mole sodium bisulphite and heating at 100 deg. for about one hour, a resin was formed which was dispersed in water to give first a 20 per cent solution which subsequently could be diluted to 1 to 5 per cent (after 5-15 minutes). Paper treated with this resin was almost equal in wet strength to that treated with melamine resin. In papermaking the sulphomethylated product can be applied in much the same way as sizing.

The results of the present authors corroborate those of Henrikson and Steenberg. Fifteen references. Isamu Yoshino and Shozo Senda. *J. Japanese Tech. Assoc. Pulp and Paper Ind.*, **6**, No. 2, 102-109 (1952). (Original in Japanese, with brief English summary on p. 180.)

Semichemical pulps of high brightness

In a series of chemical pulping studies using beech, birch, and poplar, alone or in admixture (with and without bark), it was found that the highest brightness (somewhat over 50) was obtained with peeled poplar using a three-hour neutral

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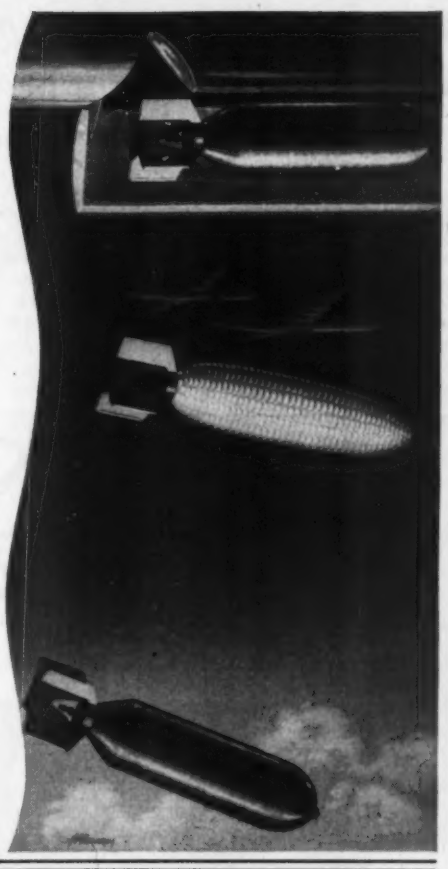

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sulphite cook without sodium bicarbonate at 150 deg. and at pH 6.7 to 7.1. The yields were 77-79 per cent. A somewhat higher brightness (58) was reached with poplar cooked 4 hours with 18 per cent sodium sulphite at 165 deg., giving a 69 per cent yield.

The author gives the tabulated results of 53 cooks and discusses the effects of differences in wood species, concentration of chemicals, temperatures, cooking time, final pH, etc., on the brightness of the resulting pulps. Initial evacuation frequently helped to increase brightness. In a few instances a brightness of 50 was achieved with species other than poplar. Almost invariably the presence of bark lowered brightness. Furthermore, the brightness was not helped by the addition of wetting agents. 8 references. H. Bouchayer (Univ. Grenoble, France). *Ann. inst. polytech., Grenoble,* 155-64 (1952). (In French.)

Determination of alkoxyl groups

In the first of two papers, the author describes a modified apparatus for determining alkoxyl (like methoxyl) groups. This is fully shown in the appended sketch (Fig. 1) and the half-tone (Fig. 2). The equipment is used in the usual way suggested by Vieböck and Schwappach (*Berichte* **63,** 2818 (1930)).

The sample which should contain 5-10 mg. of methoxyl is weighed into flask C (Fig. 1). A small quantity of red phosphorus, 5 cc. of hydriodic acid, and a little phenol are added. The washers B and B′ are each filled with 1.5-2.5 cc. of 5 per cent aqueous sodium carbonate solution, and the receiver D contains 10 cc. of 15 per cent (crystallized) sodium acetate and 0.2 cc. bromin. This absorption mixture is added so that the first receiver contains ⅔ and the second one holds ⅓ of the solution. The entire determination requires about one hour.

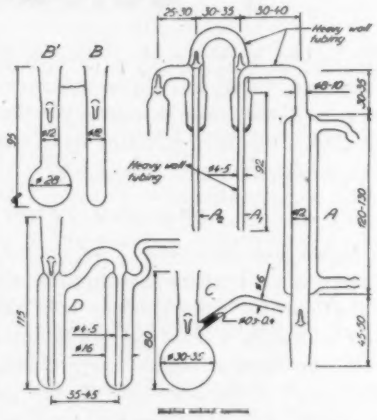

Fig. 1 — Modified methoxyl apparatus, equipped throughout with standard interchangeable ground glass joints, size No. B14. All measurements in mm. (A) condenser; (B) washer; (B′) washer for large amounts of wash solution; (C) reaction flask; (D) receiver

In the second paper, the author discusses the difficulty in determining alkoxyl (methoxyl, ethoxyl, and propoxyl) groups in the presence of sulphur compounds. For example, other investigators trying to determine the methoxyl content of lignin in sulphite waste liquors, noted great discrepancies by the usual Vieböck-Schwappach method. Presumably, these were due to reduction of sulphur compounds to hydrogen sulphide, which reacts with methyl iodide in the absorber.

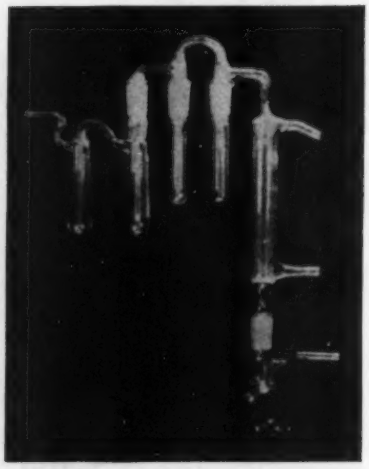

Fig. 2—Modified methoxyl apparatus

The author has explored the difficulties and reports that in the presence of appreciable amounts of sodium sulphate the alkoxyl determinations were very low and erratic

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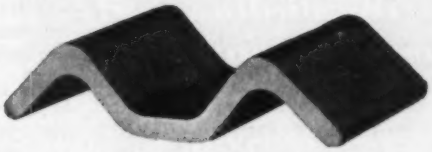

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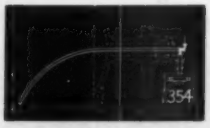

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when a phosphorus suspension or $NaHCO_3$ solution was used in the washers (cf. Figs. 1 and 2). However, when iodide solutions or cadmium sulphate was used, much better results were obtained. Even under these conditions, low figures (1-5 per cent) were obtained when fairly large amounts of sodium sulphate were found to be present. On the other hand, the determination of EtO— and PrO— groups showed excellent accuracy for the method (± 0.5 per cent).

In the recommended method, a 5 per cent cadmium sulphate solution (5-10 ml.) is used in the second wash bottle (B). This causes precipitation of cadmium sulphide. The gas rate should be reasonably high (40 ml. per min.), and the distillation requires 1.5 to 2 hours. [Cf. also Yorston and Pichette. *Pulp and Paper Mag. Canada,* **50,** (12) 114 (1949)]. Gunnar Gran. *Svensk Papperstidn.,* **55,** 255-7; 287-290 (1952). (In English.)

Purification of waste liquors emanating from paper pulp manufacture

The principal pollution effects produced by waste liquors (especially those resulting from straw cooks) are described. Autopurification is discussed briefly, and preliminary results in chemical purification obtained at Grenoble are outlined. Liquors resulting from lime straw cooks were treated with an excess of carbon dioxide and then neutralized with lime (pH 7.5). Although putrefaction is not prevented in the treated liquor, the B.O.D. is reduced considerably and the reducing power is also lowered. With liquors resulting from sodium hydroxide straw cooks, sulphuric acid was added to pH 7.8; but the decanted liquor, although much lower in organic matter, actually showed a higher B.O.D. than did the original waste liquor.

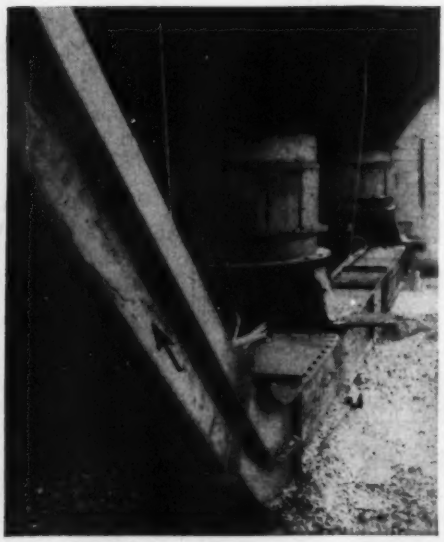
Liquors from neutral sulphite cooks of a hard- and a softwood were treated with ferrous hydroxide (formed in the liquor by addition of ferrous sulphate and calcium hydroxide). Aluminum hydroxide could also be used as a deflocculating agent. In the case of the softwood, the treated waste liquor showed a much lower reducing value and B.O.D. (*i.e.,* after the sulphites had been oxidized with sodium hypochlorite) than did the untreated liquor. It was found expedient, however, to render the liquor slightly acid (pH 6.4) prior to emptying into a stream. M. Chêne, C. Deissenberg and N. Lion (Univ. Grenoble, France). *Ann. inst. polytech., Grenoble,* 45-53 (1952). (In French.)

The influence of the dandy roll on sheet properties

The effect of the woven dandy roll on the physical properties of paper sheets made from various furnishes was studied and the results are recorded in graphic form. The dandy roll does not influence breaking length, elongation, shrinkage or dimensional stability of the sheet but augments fiber alignment in the machine direction. Thus, the ratio of breaking length in machine direction to that in the cross direction is improved by the use of the roll, which also improves the transparency of the sheet by preventing undue fiber agglomerations, but showed no very marked effects until the "look through" of sheets (prepared with and without the roll) was examined. The position at which the roll should be installed is discussed. Best results are obtained with long-fibered stock on low-speed or medium-speed machines. Wilhelm Kilpper. *Das Papier,* **6,** 44-6 (1952). (In German).

Capillary properties of pulps and papers

The authors examined five sulphite pulps relatively high in alpha-cellulose (91.5-95.0) and have reported the following: time in seconds required for a 10 cm. capillary rise of water on the pulp strip, the corresponding average radius of capillaries in the sheet (in microns); the time required for a three cm. rise of 18 per cent sodium hydroxide; "swelling" noted in *N* sodium hydroxide after 1200 seconds (recorded as the weight of a sheet after steeping, divided by original weight); "swelling" noted in mercerizing strength sodium hydroxide at the end of 0.5 hour; the specific surface (cm^2/gram); the specific volume (cm^3/gram) and the average fiber length. The techniques for making these determinations and the necessary calculations are described, and the possible correlation is discussed. M. Chêne and P. Mantelet. *Ann. inst. polytech., Grenoble,* 55-66 (1952). (In French.)



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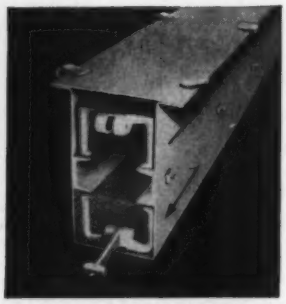

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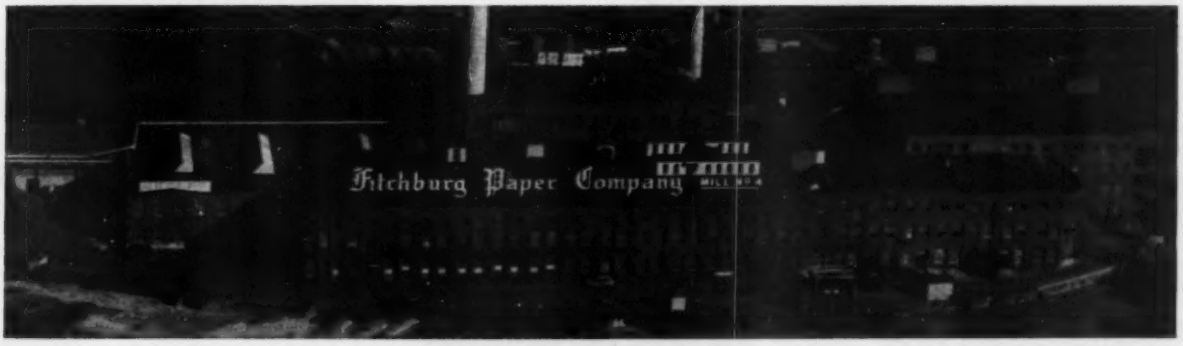

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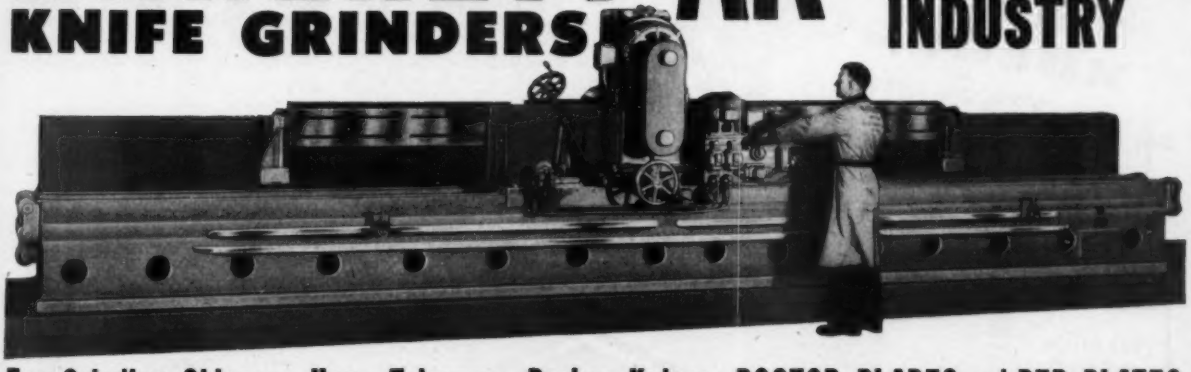

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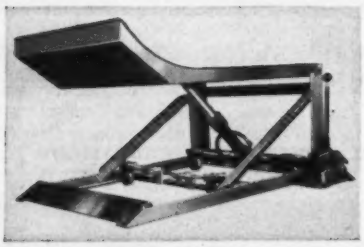

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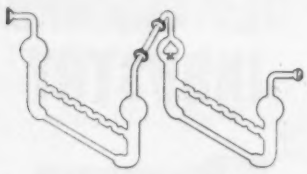

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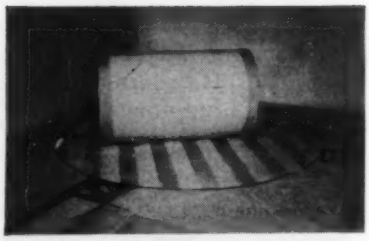

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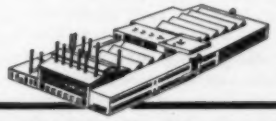

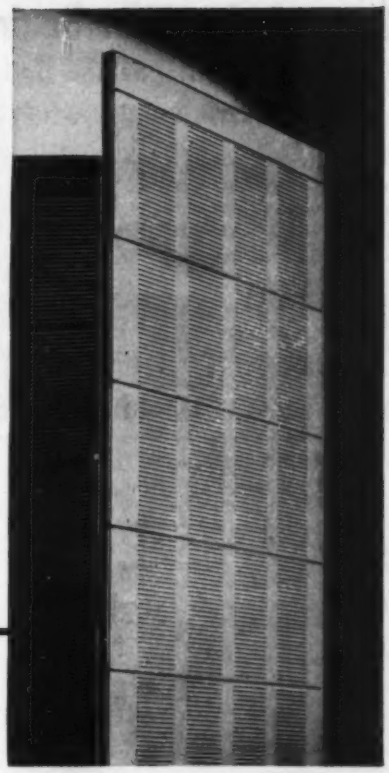

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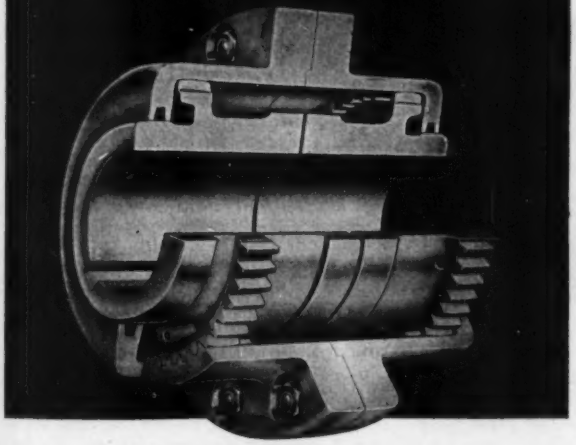

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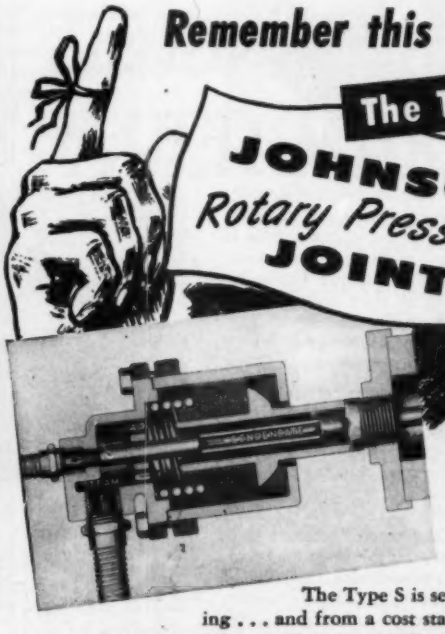


Write for Catalog JS-3

The Type S is self-supporting . . . and from a cost standpoint it carries its own weight too. It stops misalignment cold because it shifts with the roll — slashes maintenance because it's completely packless and self-lubricating. It's the perfect answer for many jobs.

The Johnson Corporation
845 Wood St., Three Rivers, Mich.

Two of the Men Behind Eastwood Wires

Joseph Zigo and Frank Hunt

GET A BIG "LIFT" FROM THEIR WORK

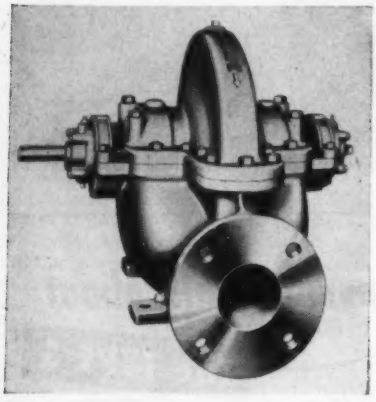
Joe and Frank are shown hoisting an end section of a new high-speed loom, pointing up the versatility and completeness of our machine shop. This large frame was finished and fitted with bearings right here in the plant.

Products of our own apprentice training system, our machine shop personnel are "at home" on a drill press, a lathe or any other modern power tool.

Whether it's building a new loom or machining a tiny replacement part, they know their jobs because they were "brought up" on them, and they share the Eastwood pride of craftsmanship in making it possible for the production departments to turn out fine wires for fine paper mills.

EASTWOOD-NEALLEY CORPORATION • Belleville, N. J.

General Motors diesel engine. The 315 and 210 cfm sizes offer a choice of either GM diesels or Continental Red Seal gasoline engines. The 105 uses a Continental gasoline engine. *Ingersoll-Rand Co., Dept. PC, 11 Broadway, New York 4, N. Y.*



Pumps

A new line of Peerless horizontal, split-case, general service pumps has recently been announced. The outstanding feature is the use of standard mechanical shaft seals, instead of conventional stuffing boxes, resulting in a saving in floor space, shorter shaft lengths, improved performance characteristics and easier pump servicing.

This line of pumps, designated as the Peerless Type AS, is available in discharge sizes from 1½ in. through 4 in. Capacity range is up to 750 gpm and head range is up to 230 ft. General application is for pumping water and clear liquids up to 200 F. where no solids are in suspension. All types of drives are available with the Type AS pump, including direct-connected electric motor through a flexible coupling, gasoline engine and steam-turbine drive. *Food Machinery & Chemical Corp., Peerless Pump Div., 301 West Ave. 26, Los Angeles 31, Calif.*

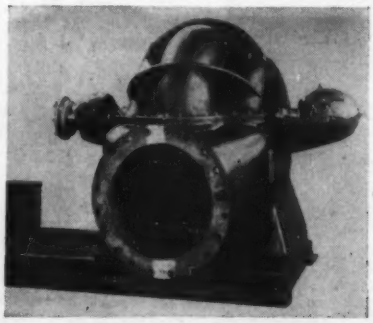
Bushing

A new type of "Magic-Grip" bushing for the stationary-control, wide-range "Vari-Pitch" sheave makes possible quick and easy installation or removal of the sheave and permits mounting it on the shaft so that the adjusting control mechanism is either toward the motor bearing or away from it.

This new type bushing as used in the "Vari-Pitch" sheave consists of two split-tapered sheaves, one within the other. When drawn together with the locking screw, the bushing sleeve is contracted on the shaft and the outer sheave sleeve is expanded against the discs simultaneously to effectively lock the entire mechanism with all working clearances eliminated.

All torque is transmitted by keys in the two sleeves so that stresses due to starting, stopping or sudden overloads will not affect the sheave setting in any way. Spacing of the discs to produce different pitch diameters is accomplished with the adjusting screw while the locking screw is in loosened position.

The new "Vari-Pitch" sheave is approximately 20 per cent lighter than the former wide-range, stationary-control, straight-bore "Vari-Pitch" sheave, which results in less weight on motor bearings and makes the sheave easier to handle. *Allis-Chalmers Mfg. Co., General Machinery Div., Milwaukee 1, Wis.*

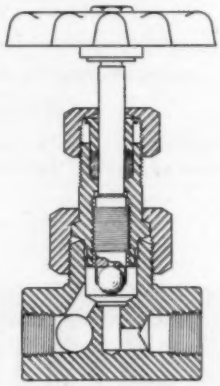


Water pump

A high capacity 24-in. double suction water pump has been added to the "Miami" line of centrifugal pumps for paper stock and water.

This large Class "A" water pump is heavily constructed and features a fully split casing to facilitate inspection or removal of rotating element without disturbing piping connections. An open-type impeller with removable side plates makes this pump especially adaptable for pumping service on silt-laden river water.

The impeller is mounted on a heavy shaft carried in oversized short centered anti-friction bearings. The pump and motor are mounted on a single base. This pump is capable of handling up to 24,000 gpm of water, white water or thin stock. *Shartle Bros. Machine Co., Middletown, Ohio.*



Ball valve

A new ¼ in. ball valve, recommended for working pressures up to 3000 psi, has recently been introduced to the market.

Shutoff is provided by a stainless steel ball which closes into a machined, conical seat. The ball, retained at the end of the stem, is free-rolling so that every closing brings a new surface into contact with the valve seat. Alignment of ball to seat is piloted by a forged steel, union-type bonnet, fitting tightly to the body and assuring a correct valve closure.

Especially useful on meter manifolds, gauge lines, seal chambers, bleed-off connections, sampling connections and lubricator shutoffs, this ball valve is universally adaptable in applications for liquid, gas and steam service. *Foxboro Co., Foxboro, Mass.*

Beta gauge

A new mounting for the AccuRay beta gauge, specially designed for use in the paper and boxboard industry, is of the overhead type which permits the gauge to be installed on paper machines without the necessity of supporting base members, providing more floor space for rethreading and handling broke.

Constructed of welded steel beams and plates, the AccuRay measuring unit is supported in rigid alignment, yet rides freely

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- Ball bearings throughout.
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- Controlled wax heating — steam, oil, or electricity.
- Polished, chrome-plated cooling rolls — changeable to heat rolls for dry waxing.
- H-S friction clutch—flat or V-belt drive.
- Single lever adjustable squeeze rolls.
- Center shaft friction type rewinder.

Write for complete details.

Completely versatile, this modern machine processes fully saturated or dry coated wax papers with equal ease of operation. In wet wax production, sheet is taken from parent roll and immersed in wax bath with movable adjustments to time the dwell of immersion period. Sheet then passes through a squeeze roll section to remove excess wax and through a chilled roll section direct to rewinder. For dry waxing, sheet is carried direct to an applicator roll where a measured quantity of wax is applied to one side of sheet, thence to a heated pressure roll which forces the wax into sheet. Unit features rewinding into a firm, accurate roll. Machine is built in two sections for spacing application unit and chilling-rewind seetion as desired. Open type construction permits free adjustment means and rapid material roll changes.

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CONTINENTAL

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on its overhead carriage to traverse the web. Throat depths up to 100 in. are available in the new model, making it possible for a dual installation to give a complete profile measurement for sheets as wide as 200 in. *Industrial Nucleonics Corp., 1205 Chesapeake Ave., Columbus 12, Ohio.*

Testing machine

In many test programs it is desirable to apply a load to specimens with extremely slow speed. This load must be capable of being stopped instantly. The new Dillon hand-operated Multi-Low-Range tester serves both of these functions. It does not require a variable speed drive or other electrical controls.

Available with four grip clearances, four individual scales on the basic dial, and a supplementary dial, the tester has a net weight of 170 lb. and over-all height of 64 in. A set of gripping fixtures for flat specimens up to ⅛ in. thick by 1¼ in. wide is included with each unit. These can be quickly removed and replaced with a variety of other standard grips which are available for wire, paper, wood, adhesives, etc.

A pendulum-type mechanism set in carefully machined bearings is employed. The pointer remains at peak load after a specimen breaks and is reset by simply releasing the pendulum pawls. Elongation readings are provided by means of a special elongation scale and traveling hair line affixed to the moving platen. Tests can be made in tensile, compression, transverse and shear.

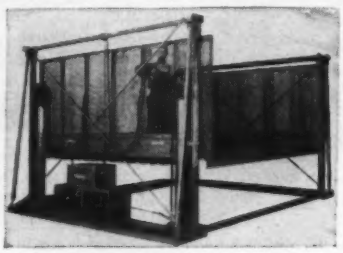
The entire assembly is finished in polished chromium and hammered gray enamel baked on. *W. C. Dillon & Co., Inc., 1421 South Circle Ave., Forest Park, Ill.*

Variable speed motor

A lightweight Varidrive motor, Type 5 VA, in fractional horsepower equipped with mechanical remote control has recently been developed.

The remote control feature includes a control handwheel with indicator dial and a 5-ft. flexible cable so that the machine operator can control the Varidrive's speed distant from the motor. An advantage of this control arrangement is that the dial indicator is a part of the control, making it unnecessary to go to the motor to see what speed is being "revved up." Connecting cable longer than 5 ft. can be used if necessary.

Available in ¼, ⅓, ½ and ¾ h.p. and in a speed ratio up to 10 to 1 over a range of 4 to 10,000 rpm, the entire unit is a one-package motor with the variable speed mechanism enclosed. *U. S. Electrical Motors Inc., Box 2058, Los Angeles 54, Calif.*



Four post lifter

A new series of electric-hydraulic four post lifters has recently been announced. The "four posters" facilitate heavy loading of trucks and railway cars, and are especially fitted to level-to-level and floor-to-floor movement of trucks and skids, materials, heavy parts, etc., in plants and warehouses.

Electric-hydraulic powered and designed for continuous operation, these lifters feature higher load capacity, higher speed lifting, larger platforms and greater lifting range than electric-mechanical type lifters.

Safety features include: minimum safety factor of 4 used throughout the lifters, "deadman"-type pushbutton controls, expanded metal platform guards, safety tread "non-skid" platforms, positive stops to prevent overtravel of rams, overload relief in hydraulic system, and post rings that lock platform to posts if chain should fail. *Service Caster & Truck Corp., Albion, Mich.*

New Products Briefs . . .

MASK AND SHIELD—A new featherweight Lumarith plastic mask and cotton gauze filter protects nose, lungs, face and eyes against dusts, chips and particles in all types of light, non-toxic work. The filter pad consists of cotton and sanitary gauze specially treated for softness and is replaceable. *General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa.*

PURIFIER—Dirt, moisture, riser discharge and solids are removed before passing on to the distribution piping when this new internal downflow purifier is installed in an auxiliary tank immediately above evaporators, packed towers, deodorizers, stills, bubble-cap towers and inside steam drums, flash tanks, receivers and other vessels. Called internal downflow Hi-eF purifiers, they serve numerous functions, depending upon application. Upflow purifiers are also available. *V. D. Anderson Co., 1935 W. 96th St., Cleveland 2, Ohio.*

EYE WASH FOUNTAIN—Designed to gently spray a large volume of water at neutral pressure, a new eye, nose and mouth wash fountain instantly wets all parts of the face without danger of recontamination. This fountain has a porcelain-enameled bowl with all piping and fittings of red brass, chromium plated. It is actuated by a non-leak, bat-wing valve and comes in pedestal type or for wall mounting. *Logan Emergency Showers, Inc., Box 111, Glendale, Calif.*

ION RESIN—Amberlite IR-112 (H), a member of the family of "ion exchange" resins produced by Rohm & Haas, is now available to laboratories. These tiny pieces of nuclear sulphonic acid have an acid strength about equal to sulphuric acid but with "educated" structures that permit only their hydrogen ions to move into solution. This feature, plus its unusually high porosity, makes this new Amberlite of special importance in the treatment of non-aqueous fluids, catalysis of organic reactions, recovery of large cations from waste and process solutions, and operation in the hydrogen cycle. *Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.*

ELECTROPHORESIS-CONVECTION APPARATUS—To improve analytical preparative procedures, the new electrophoresis-convection apparatus provides higher resolving power, purity, planned and volume fractionation in separating a mixture of proteins into electrophoretically distinct components, according to the manufacturer. *Beckman Instruments, Inc., South Pasadena, Calif.*

RUBBER-BASE PRIMER—A new rubber-base pigmented primer now being produced is formulated on a synthetic rubber resin base not a water latex emulsion. It primes, seals and covers in one coat and dries in two to four hours. It seals "hot spots" and provides a vapor barrier preventing passage of moisture to outside walls and will not support mold or mildew on inside walls. *Tropical Paint & Oil Co., Cleveland 2, Ohio.*

HAND LAMP—The GS Model 22 is a durable new 7½ volt powered hand lamp which may be used as a trouble, work or emergency light, either indoors or outdoors. The unit is fitted with a rubber grip handle, two way fingertip switch control, 3 C.P. on low beam and 21 C.P. on high beam. *General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa.*

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The Paper Industry New Literature

Books

DIRECTORY OF THE PAPER INDUSTRY OF EUROPE, 1952-53. (In German.) Published by Verlag Birkner & Co., Darmstadt, Germany. 1050 pages. 7 x 10. DM 42 (about $10.00 U.S. coin). Traveller Edition DM 26 (about $6.20 U.S. coin).

This directory is divided into nine parts. Part I covers paper mills, board mills and wood pulp mills in Germany, and contains an alphabetic firm register, an index of places, and a classified section by countries (German). Special advertisements of paper mills are contained in Part Ia. Part II covers paper, cardboard, cellulose and wood pulp mills of Europe, also containing an alphabetic firm register, an index of paper mills and a classification by countries. Part III deals with the wholesale trade, including paper and board merchants, wholesale stationers, and merchants for paperware in Germany, paper and board merchants and merchants for paperware abroad, and paper importers and exporters in Germany and abroad.

Paper agents and mill representatives, agents of paper converters, processors, finishers, etc., agents abroad, paper import and export agents, pulp and cellulose agents and representatives, forwarding agencies for paper transports and paper transport insurances are listed in Part IV. Products of paper, cardboard, cellulose, and wood pulp mills are classified by items in Part V. Part VI deals with the paper-goods, cardboard and paper converting industry, giving an alphabetic firm register and an alphabetic list of firms classified by places. Products of the paper-goods, cardboard and paper converting industry and sources of supply for the whole paper industry, classified by items, are presented in Parts VII and VIII. The last Part contains an English, German and French vocabulary, sign explanations schedules, statistics, lists of experts in the paper trade, paper trade associations, promotive organizations and institutions for professional training, technical periodicals, etc.

The table of contents, and Parts V, VII, and VIII are printed in three languages: English, German, and French.

CORROSION—CAUSES AND PREVENTION. Third Edition. By Frank N. Speller. Published by McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 18, N. Y. 6 x 9. 664 pages. $10.00.

The first section of this new edition presents the theory of corrosion and the second section, the methods of preventing it. All the material has been brought completely up to date, and new sections on biological influence and cathodic prevention have been added.

Facts and factors already known, together with the generally accepted Electrochemical Theory of Corrosion, are discussed in the beginning of the book. This introduces a discussion of a system of classification of corrosion phenomena and the principles of corrosion testing. The second section on prevention gives specific methods for the application of preventive measures in respect to corrosion in air, liquids, closed water systems, steam power plants, locomotives, steam and hot-water heating plants, underground pipes and in other situations.

All data are simply presented without the use of mathematical and thermodynamical terms or involved chemistry. Seventy tables and 177 illustrations are included.

STANDARDS OF HYDRAULIC INSTITUTE. Ninth Edition. Published by Hydraulic Institute, 122 East 42nd St., New York 17, N. Y. $3.00 (Foreign orders $3.50).

Of interest to purchasers and manufacturers of hydraulic pumps, this book presents detailed engineering information concerning frictional resistances to the flow of liquids in pipes. The ninth edition contains much entirely new information, as well as other material which has been revised to bring it up to date and in line with modern engineering procedures in the hydraulics field.

Booklets and Pamphlets

FOR BETTER ROADS. Published by Felker Bros. Manufacturing Co., Marshfield, Wis. 16 pages. Designed to acquaint the public with the use of sulphite waste liquor as it is used as a road binder, this booklet is well illustrated and interestingly written.

CORROSION RESISTING PROPERTIES OF THE AUSTENITIC CHROMIUM-NICKEL STAINLESS STEELS. Published by International Nickel Co., Inc., Development and Research Div., 67 Wall St., New York 5, N.Y. 32 pages. 6 x 9. Containing 18 tables showing the results of tests on numerous austenitic stainless steels in various solutions, acid neutral and alkaline, this general publication covers the mechanism of corrosion resistance in stainless steels; factors affecting their corrosion; their behavior in various corrosive environments, marine and industrial atmosphere, in organic and inorganic acid salt solutions and in halogen salts and weak and strong bases; and the preferred practice in construction and use of stainless steels.

QUALITY OF LOGS AND LUMBER OBTAINED FROM AN IMPROVEMENT CUT IN SECOND-GROWTH HARDWOODS IN NORTHERN WISCONSIN. (Station Paper No. 26.) By Carl Arbogast, Jr. Published by Northern Lakes Branch, Lake States Forest Experiment Station, U. S. Department of Agriculture, Forest Service, University Farm, St. Paul 1, Minn. 8 x 10½. 18 pages. This pamphlet begins with the problem to be solved and then presents a possible solution. Next it goes on to test the proposed solution, telling how the study was made and presenting the findings. Many tables are included. A list of Station Papers from 1945 to 1951 is given.

TECHNICAL COOPERATION WITH UNDERDEVELOPED COUNTRIES. By Philip C. Newman, John E. Ullmann, and Robert S. Aries. Published by Chemonomics, Inc., 400 Madison Ave., New York 17, N. Y. 6 x 9. 96 pages. Written by an economist, an industrial engineer, and a chemical businessman, this booklet reviews and analyzes thoroughly what can be done in undeveloped areas in terms of concrete industrial planning. The subject is discussed both from a theoretical and a practical aspect. It defines the problem of industrialization, sets up the criteria for such growth, and analyzes past action in the light of these aims.

SUBJECT INDEX TO BIBLIOGRAPHY OF TECHNICAL REPORTS, VOL. 15. Published by Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $1.00. The index enables researchers to locate reports on any subject carried by the "Bibliography of Technical Reports" for the period January to June, 1951. Similar indexes to Volumes 6, 7, 11, 12, 13 and 14 are available at the same price.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.

Caustic Soda. Dow Chemical Co., Alkali Sales Dept., Midland, Mich.—A newly revised booklet covering all phases of caustic soda specifically deals with: the manufacture of caustic soda; chemical and physical properties; economics involved; methods of handling and storing; technical data; methods of analysis, and first aid treatment for caustic burns.

Flow Rate Regulators, W. A. Kates Co., 430 Waukegan Rd., Deerfield, Ill.—This 4-page bulletin, No. 521, describes in detail the Kates line of flow rate regulators. The principle of operation, uses, and construction of these flow rate regulators are presented.

Hydraulic Lift Trucks. Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill.—Bulletin 525, containing 8 pages, presents hydraulic lift trucks which move materials and goods in large loads. It contains complete specifications and, also, ordering information which explains all figures in the specifications.

Bleaching Agent. E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.—This new 8-page technical bulletin, P30-452, discusses the properties and applications of du Pont's

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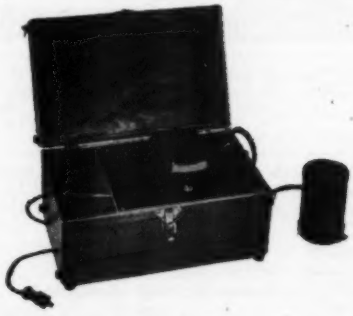

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"Albone" 35 per cent hydrogen peroxide. It lists chemical and physical properties, describes control of reactions and decomposition, methods of analysis, and gives packaging information. It also lists contruction materials for alkaline and acid peroxide solutions and includes a section on uses.

Pumps. Tuthill Pump Co., 939 East 95th St., Chicago 19, Ill.—A new type of reference chart on small pump applications has recently been developed. In one convenient table (letterhead size), this guide lists the various types of Tuthill pumps, the services for which each is built, the performance characteristics, types of packing, styles of mounting, and features that distinguish each model.

Temperature Control Unit. Illinois Testing Laboratories, Inc., 420 N. LaSalle St., Chicago 10, Ill.—This 8-page bulletin describes the Alnor Pyrotac, a new temperature control unit. Presented in this bulletin are an explanation of how the Pyrotac works, outstanding features, construction, applications, etc., in addition to a brief description of other Alnor instruments.

Electric Fork Truck. Lewis-Shepard Products, Inc., Dept. R-1, 125 Walnut St., Watertown, Mass.—Economical fork truck operation is the subject of a new 12-page catalogue featuring the Lewis-Shepard "J" Model.

Resins. Monsanto Chemical Co., Plastics Div., Springfield, Mass.—A series of water-soluble, modified styrene polymer resins, designated as the Lustrex X-700 series, with a variety of applications in the paper industry and other industries are described in a new bulletin.

Pumps. Food Machinery & Chemical Corp., Peerless Pump Div., 301 West Ave. 26, Los Angeles 31, Calif.—Eight-page Bulletin No. B-1350 describes and illustrates features of construction of Type AS pumps, together with pump cross-section, elevation and plan drawings and dimensional data.

Electric Tiering Truck. Raymond Corp., 8091 Madison St., Greene, N. Y.—The new design represented by the straddle-type tiering truck is described in Bulletin 730, which gives complete specifications and shows photographs of the truck operated in elevators, tiering (with the telescopic model) in racks 130 in. off the floor from a 6-ft. aisle.

Leather Belting. J. E. Rhoads & Sons, 35 N. Sixth St., Philadelphia 6, Pa.—This 40-page illustrated handbook on the specific applications of Rhoads leather belting in the pulp and paper industry devotes 23 pages to proper selection, installation and maintenance of belting for paper machine cone drives. Another section of the handbook deals with the application of Rhoads leather belting on paper and pulp mill equipment, other than the paper machine. There are complete specifications for all the products manufactured by this company and offered to the paper industry.

Flexible Couplings. Thomas Flexible Coupling Co., Warren, Pa.—Engineering Catalogue No. 51, containing 78 pages, describes Thomas's full line of all metal flexible couplings for power transmission. Couplings are grouped and indexed for quick reference. Keyway data, standards for straight and tapered bores, as well as ordering instructions are included for each group. Standard couplings are shown in individual sections of the catalogue and are followed by a special section showing many couplings designed for specific purposes, with photos of typical installations.

High-Temperature Fractional Distillation. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Windrim Aves., Philadelphia 44, Pa.—Instrumentation Data Sheet 10.16-14 describes the Podbielniak apparatus with multi-range ElectroniK potentiometer for high temperature frequency distillation studies. The 4-page leaflet describes the application, operation, technique and other pertinent facts concerning the apparatus. Included are illustrations showing the apparatus, a schematic diagram of the system and typical records of distillation curves.

Air Compressors. Worthington Corp., Harrison, N. J.—Monobloc air compressors capable of 2.6 to 5.0 CFM and up to 150 psi are the subject of Specification Sheet No. H-605-B2.

Resin Emulsion Adhesives. Paisley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill.—This illustrated 6-page magazine reprint explains the development, preparation, and advantages of resin emulsion adhesives. Written in non-technical language, it is designed to acquaint the layman user of adhesives with the special properties and handling techniques of this new category of labeling, sealing and fabricating adhesives.

Fabricated Fittings. Naylor Pipe Co., 1230 East 92nd St., Chicago 19, Ill.—This 4-page bulletin, No. 525, on standard and special fabricated fittings presents specifications and prints on standard fittings for lightweight pipe. It also gives illustrations of special fabrications.

Pyrometers & Thermometers. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Station 40, Wayne & Windrim Aves., Philadelphia 44, Pa.—This 8-page illustrated Bulletin 1051 describes a new line of non-control pyrometers and resistance thermometers, which use the same high resistance plug-in galvanometer unit and two-compartment case employed in the Pyr-O-Vane and Protect-O-Vane electric contact controllers. Included are wiring diagrams and circuit information of pyrometer, resistance thermometer, tachometer and other actuations.

Industrial Heating. Jensen Specialties, Inc., 9335 Freeland Ave., Detroit 28, Mich.—This 16-page brochure contains reference information on industrial heating problems and describes Jensen Pan-L-Heat ovens. A helpful table entitled "Steps in Selecting Industrial Heating Equipment" is presented. The brochure elaborates on each of these steps. Charts and tabels are provided so that readers may develop answers to their own heating problems.

Neoprene. Gates Engineering Co., P. O. Box 1711, Wilmington, Del. Three 4-page folders describing neoprene products are available. Folder N-1 is a general folder describing neoprene protective coatings and includes a neoprene products recommendation chart. N-2 describes N-200-1 neoprene liquid lining, including its characteristics, acceleration and application data, and physical properties. N-3 presents information on neoprene N-700 maintenance coating, giving its characteristics, advantages, and applications.

Switches. Micro Switch, Freeport, Ill.—Data Sheet 63 describes the "make-before-break" snap-action switch. It presents in detail, with diagrams, the functioning of the two moving contacts in closing the normally-open circuit before the normally-closed circuit is opened. Characteristics, electrical ratings, and dimensions of the switch are completely covered. The three terminal designs and a few of the many actuator designs with which the basic make-before-break switch may be equipped are shown.

Insulation and Cement. Baldwin-Hall Co., Trenton, N. J.—This 4-page folder describes Mono-Block, a block form insulation and Powerhouse cement, a finishing cement that insulates.

Furan Coating. Carboline Co., 7603 Forsyth Blvd., St. Louis 5, Mo.—Four-page Bulletin No. 500 and Data Sheet C-46 present new data on the improved brush-on furan lining for handling corrosives, known as Carbo-Kote 6020. These bulletins, for the first time, present detailed data on corrosion resistance and a new, unique heat resisting primer for steel and concrete.

Turbine Pumps. Worthington Corp., Harrison, N. J.—A new sound stripfilm (slides on continuous 35 mm strip), entitled "The Vertical Turbine Pump Story" contains 165 frames in color and is sychronized to a 20-minute narration. The individual pictures in the film consisting of drawings, art work and photographs, visually clarify and emphasize the main points of the program which was designed and produced by Worthington.

Conveyor Chain. Acmor Conveyor Chain Co., 17100 Miles Ave., Cleveland 28, Ohio—This 4-page bulletin, No. HP-1, describes the hollow pin conveyor chain and attachments.

Expansion Joints. Flexonics Corp., 1412 South Third Ave., Maywood, Ill.—Eight-page Catalogue CMH-119R describes and illustrates the new Flexon line of expansion joints, presenting complete specification and installation data for Flexon-type Free-Flexing joints for low pressure applications, Controlled-Flexing joints for high pressure installations, and Flexoniflex joints for the handling of extremely high pressures.

Bin-Level Control Switches. Stephens-Adamson Mfg. Co., Aurora, Ill.—This 4-page bulletin, No. 11-O, describes the "Tellevel" automatic bin-level control switches. Complete installation directions are included, as well as suggested wiring diagrams for direct control of conveyor units, or for actuation of warning light, or other signals.

Instruments. Taylor Instrument Companies, Public Relations Dept., 95 Ames St., Rochester 1, N. Y.—"Information At Work" is the title of a 30-minute full-color film on instruments. It traces the development of instruments from those which do a relatively simple job to today's products used to indicate, record and control the most complex processes.

Dehumidification. Abbeon Supply Co., 179-15 Jamaica Ave., Jamaica, N. Y.—The bulletin, "A Few Facts About Dehumidification for Industry," presents various methods used to remove moisture from the air, some recommended humidities, and, in addition, describes a number of instruments both for general use and scientific purposes to determine the amount of moisture in the air.

Pyrometer. Minneapolis-Honeywell Regulator Co., Station 40, Brown Instruments Div., Wayne & Windrim Aves., Philadelphia 44, Pa.—Specification sheet 114 describes the Pyr-O-Vane controller.

Fork Lift Trucks. Buda Co., Harvey, Ill.—This 8-page bulletin, No. 1570, describes the modern Diesel or gasoline-powered "FT" Series fork lift trucks available in capacities from 3000 lb. to 7500 lb. Many photographs, tables, and diagrams are included.

More Important Than Ever
H & K Perforated Screens

H & K Perforated Metal screens for the paper industry (bull, chip and pulp screens, digester bottoms, etc.) will give you the assurance of uniform hole sizes and spacings, smooth easily cleaned surfaces, a wide choice of metals and alloys for your particular application, and maximum strength for long service. They are furnished in standard or special patterns, and may be fabricated (rolled, formed, welded, brazed, etc.) to your specifications. Our Catalog No. 62 contains a wealth of screen information—write for your copy.

Also remember — H & K Standardized Guard Parts for sturdy belt and machine guards at a saving.

The Harrington & King Perforating Co

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Goulds STOCK PUMPS reduce stock handling headaches

Fig. 3105

Positive even flow. No jamming. Easy to inspect. Easy to adjust for wear. Designed for handling paper stock of all kinds and consistencies. Write for descriptive Bulletin 723.1.

GOULDS PUMPS, INC., Seneca Falls, N.Y.

MEN WANTED—POSITIONS OPEN: We can place—newsprint mill supt.; asst. supts. cylinder and fourdrinier mach. mills; sales mgr. for corrugated boxes; cylinder and fourdrinier mach. foremen. Power plant supervisors, master mechanics, plant engineers, mech. engineers, many attractive openings at good salaries; several chemists, chem. engineers, color matchers and tech. graduates with or without mill experience; laminating mach. operator; newsprint salesman, also salesman for folding cartons; machine tenders and back tenders.

List your confidential application with us to keep informed of attractive positions open in the pulp and paper mills.

CHARLES P. RAYMOND SERVICE, Inc.
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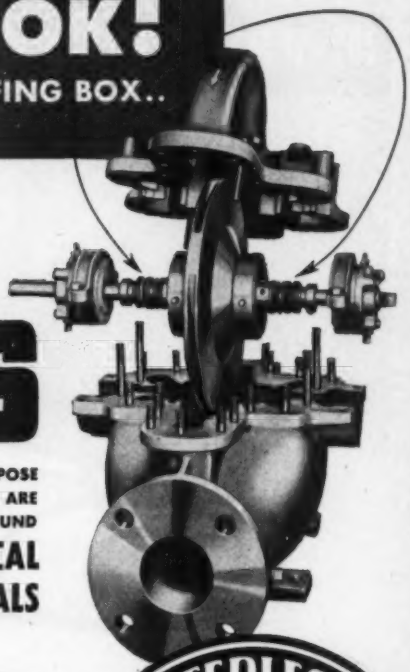
Specialists in placing and supplying pulp and paper mill executives

WANTED—Recent papermaking or chemical engineering graduate, with some technical experience in paper or paperboard desirable. Man selected will be responsible for product and process development work as a member of the technical staff in a progressive, integrated midwestern board mill. Excellent advancement opportunities exist. In replying, give complete background of education and experience along with salary requirements. Address: Box 544, The Paper Industry.

PLANT ENGINEER—To coordinate activities of design engineering firm and contractors during construction. Direct all engineering and maintenance in completed mill. Should have not less than ten years experience in pulp and paper mill maintenance. Experience in maintenance of sulphate pulp production facilities necessary. Familiarity with groundwood and newsprint production desirable. Summarize experience. Bowaters Southern Paper Corp., Calhoun, McMinn County, Tennessee.

LOOK!
NO STUFFING BOX..

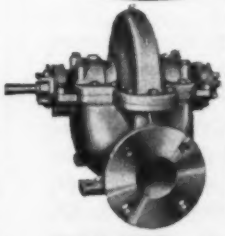


Peerless type AS

GENERAL PURPOSE PUMPS ARE DESIGNED AROUND
MECHANICAL SHAFT SEALS

PEERLESS PUMPS

HERE ARE 4 BIG ADVANTAGES



1. **NO LEAKAGE.** Simple, positive acting, shaft seals prevent leakage of liquid from pump.
2. **LESS MAINTENANCE.** Stuffing box is completely eliminated; maintenance trouble and expense is reduced to the minimum.
3. **CUSTOM PUMP—STANDARD PRICE.** The Peerless Type AS pump costs no more than ordinary split-case pumps. You get extra quality without paying a premium.
4. **EASILY SERVICED.** Entire rotating element can be removed from pump without disturbing line connections. Shaft seals and bearings are standard items, easily available from commercial sources.

WRITE FOR BULLETIN No. B-1350 which completely describes and illustrates the modern design and construction features of Peerless Type AS pumps.

PEERLESS PUMPS fmc

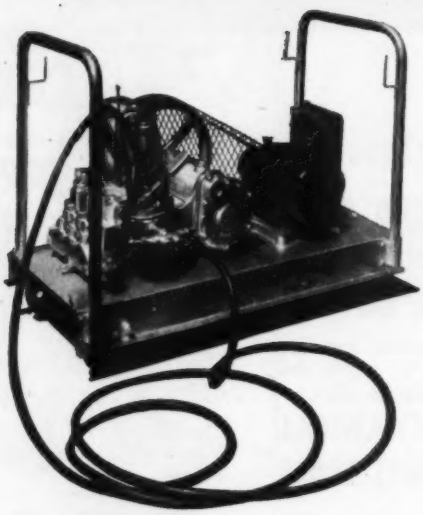
PEERLESS PUMP DIVISION
Food Machinery and Chemical Corporation
301 West Avenue 26, Los Angeles 31, California

Please send us a copy of Bulletin No. B-1350 describing Peerless Type AS pumps.

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____
Pap. Ind.

PEERLESS BUILDS DEPENDABLE PUMPS

FARQUHAR Portable HI-PRESSURE CLEANER



CUTS CLEANING COSTS *for*

- *Industrial Plants*
- *Food Processors*
- *Packing Plants*
- *Dairies*
- *Hospitals, Institutions*
- *Chemical Plants*
- *Public Buildings*
- *Paper Mills*

IF you have a cleaning problem, here's the most efficient and economical way to solve it! This completely *portable* Farquhar Hi-Pressure Cleaning Unit sweeps away accumulations of process refuse, residue, debris, or any other kind of dirt from walls, floors, vats, belts, machinery, etc., *with high velocity jet of hot or cold water at 300 to 500 p.s.i.* Ideal for cleaning in cracks, corners, other out-of-the-way places. Saves time! Saves money! Available in 10 gal. per min. size for 1 gun or 20 gal. per min. for 2 guns operating simultaneously.

Write *now* for complete information on how this amazing Farquhar Hi-Pressure Cleaning Unit can do your cleaning job *faster, better, cheaper!* Address: A. B. FARQUHAR CO., Special Machinery Department, 1217 Duke St., York, Pennsylvania.

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HI-PRESSURE CLEANERS
JUICE PRESSES • SPRAY COOLERS • PASTEURIZER COOLERS
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A. B. FARQUHAR CO., Division of THE OLIVER CORPORATION

MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are OPS ceiling prices, cents per pound, delivered mills:

	per cwt.
Blue Overalls	14.50
Corduroy	8.00
Washables, No. 1	6.50
Percales	12.50
Light Prints, No. 1	11.50
Khaki Cuttings—	
Sun Tan	11.50
Mixed	8.00
New White Canvas	19.00
Canton Flannels, bleached	21.00
Canton Flannels, unbleached	21.00
Shirt Cuttings—	
New White No. 1	21.00
Silesias No. 1	16.00
New Unbleached	21.00
Fancy	10.00
Linen Cuttings—	
American	14.50
White	21.00
Grey	21.00

Current quotations to mills, f.o.b. New York:

Blue Overalls	10.00 to 10.50
Washables, No. 1	4.75 to 5.00
Light prints, No. 1	8.25 to 8.50
Khaki Cuttings, Mixed	5.50 to 5.75
Canton Flannels, Bleached	14.50 to 15.00
Canton Flannels, Unbleached	14.50 to 15.00
White Shirt Cuttings, No. 1	14.75 to 15.25
Silesias, No. 1	11.50 to 12.00
New Unbleached Muslins	16.00 to 16.50
Fancy Shirt Cuttings	7.50 to 8.00
American Linen Cuttings	12.00 to 12.50

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	1.25 to 1.30
No. 2	.95 to 1.05
No. 3 and 4	.80 to .90
Twos and Blues—	
Repacked	2.75 to 3.00
Thirds and Blues—	
Repacked	2.25 to 2.50
Miscellaneous	1.75 to 2.00
Whites, No. 1—	
Repacked	5.75 to 6.25
Miscellaneous	5.00 to 5.25
White, No. 2—	
Repacked	4.75 to 5.00
Miscellaneous	4.00 to 4.25

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	5.25 to 5.50
Domestic	5.50 to 5.75
Wool Tares—	
Light	6.25 to 6.50
Heavy	6.50 to 6.75
No. 1 Scrap Bagging	4.75 to 5.00
Manila Rope—	
No. 1 large	7.25 to 7.75
No. 1 small	6.25 to 6.75
Sisal Rope—	
No. 1 large	6.50 to 7.00
No. 1 small	6.00 to 6.25
New Burlap Cuttings	6.50 to 7.00
Jute Threads—	
Foreign (Nom.)	7.00 to 7.50
Domestic	7.00 to 7.50
Strings—	
No. 1 sisal	6.00 to 6.50
No. 2 sisal	5.50 to 5.75
Soft jute	5.75 to 6.00
Mixed	3.50 to 3.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	115.00 to 120.00
Hard White No. 1	80.00 to 85.00
Soft White, one-cut	75.00 to 80.00
Soft White, No. 1	65.00 to 70.00
Soft White, Misc.	40.00 to 45.00
Fly Leaf No. 1	25.00 to 30.00
Fly Leaf, Woody No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	20.00 to 22.00
Mixed Books	14.00 to 15.00
Ledger Stock—	
No. 1 White	55.00 to 60.00
No. 1 Mixed (Colored)	35.00 to 40.00
Manilas—	
New Env. Cuttings	55.00 to 60.00
New Env. Cuts, One-Cut	—
Extra Manilas	22.50 to 25.00
Manila Tab Cards, Free of Ground Wood	65.00 to 70.00
Colored Tab Cards	45.00 to 50.00
Kraft—	
New Envelope Cuttings	60.00 to 65.00
Tripled Sorted No. 1 100%	40.00 to 45.00
No. 1 Old Assorted	27.50 to 30.00
News—	
White Blank	70.00 to 75.00
Overissue	26.00—
No. 1 Folded	18.00—
Old Corrugated Containers	18.00—
New Jute Corrugated Cuts	23.00—
Mill Wrappers	10.00—
Box Board Chips	9.00—
No. 1 Mixed Paper	8.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.55—
Ground, cwt.	4.30—
Powdered, cwt.	4.70—
Blanc Fixe—	
Pulp, bulk, ton	90.00—
Dry, barrels	95.00—
Bleaching Powder—	
Drums, cwt.	5.00 to 6.00
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	28.00—
Argentine, lb.	22.00—
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 15.00
Domestic Coating Bulk (mine) ton	15.00 to 25.00
Imported (ship side) Bulk (lump) ton	22.00 to 30.00
Chlorine—	
Tanks cars (wks) cwt.	2.70—
Gelatine (silicin), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	34.00 to 34.50
Litharge, powd. bbl. lb.	.17¾ to .18¾

MARKET QUOTATIONS

	New York, per 100 lbs.	
Rosin (Gum)—		
E	8.50—	
F	8.50—	
G	8.50—	
WW	8.90—	
Rosin (Wood), carlots,		
F.O.B. South	4.35 to	4.50
Salt Cake—		
Dom. bulk (wks) ton	17.00 to	23.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	23.00—	
Soda Ash—		
Bulk (works) cwt.	1.20—	
Paper bags, cwt.	1.50—	
Soda (Caustic)—		
Solid drums, cwt.	3.35 to	3.40
Ground and flake, drums, cwt.	3.75 to	3.85
Sodium Silicate—		
60 deg. 55 gal. drums, (works) cwt.	1.60 to	1.70
40 deg. 35 gal. drums, (works), cwt.	1.30 to	1.40
Starch—		
Pearl, 140 lb. bags, cwt.	6.44—	
Pearl, barrels, cwt.	6.44—	
Paper (Sp.) bags, cwt.	6.44—	
Powdered, barrels, cwt.	6.65—	
Sulphur (Crude)		
(Mine) bulk, long ton	21.00 to	22.00
Talc—		
Dom. 100 lb. bags (mine) ton	25.00 to	28.00
Canadian	35.00 to	45.00
Titanium Dioxide—		
Barium Pig, bbls., lb.	.21 to	.21½
Calcium Pig, bbls., lb.	.21 to	.21½
Zinc Sulphide, bbls., lb.	11.50 to	11.75

WOOD PULP

The following are OPS ceiling prices on domestic wood pulp, dollars per short air dry ton delivered consuming mills including the basic maximum freight allowances as provided:

Bleached sulphite	140.00—
Unbleached sulphite	132.50—
Bleached sulphate	145.00—
Semi-bleached sulphate	140.00—
Unbleached sulphate	132.50—
Bleached soda	140.00—
Ground wood	92.50—
Sulphite screenings	72.50—
Sulphate screenings	67.50—
Ground wood screenings	60.00—
Unbleached sulphate siderums	132.50—
Standard news print siderun	92.50—

OPS ceiling prices on European wood pulp, dollars per short air dry ton, on dock at American Atlantic ports, follow:

Bleached sulphite	225.00—
Bleached sulphate	230.00—
Unbleached sulphite	200.00—
Unbleached sulphate	200.00—

Current quotations on imported wood pulp, dollars per short air dry ton, on dock American Atlantic ports follow:

Bleach. sulphite, Canadian	145.00—
Bleach. sulphite, Swedish	140.00—
Bleach. sulphite, Norwegian	140.00—
Bleach. sulphite, Finnish	140.00—
Unbl. sulphite, Canadian	135.00—
Unbl. sulphite, Swedish	115.00—
Unbl. sulphite, Finnish	120.00 to 125.00
Blch. kraft, Canadian	145.00—
Blch. kraft, Swedish	142.50—
Unbl. kraft, Canadian	100.00—
Unbl. kraft, Swedish	100.00—
Unbl. kraft, Finnish	105.00—

PAPER

Boards—

OPS ceiling prices (CPR 108) per ton, delivered consumer's mill, 10 tons or more:

Plain chip	90.00—
News vat lined chip	92.50—
Filled news	90.00—
Solid news	92.50—
White vat lined chip	132.50—
Chip tube and can stock	100.00—
Single manila lined chip	137.50—
Single jute lined chip	135.00—
White patent coated:	
.020	160.00—
.018	162.50—
.016	165.00—

Book Paper—

OPS ceiling prices (CPR 106) per cwt.:

Coated two sides		
70 lb. No. 2 enamel, 25x38-500, trimmed 4 sides	4 cases	$17.25
	Carloads	$16.30
45 lb. enamel, 25x38-500, trimmed 4 sides	4 cases	$13.05
	Carloads	$12.10
Uncoated		
55 lb. No. 2 offset, 25x38-500, trimmed 4 sides	4 cases	$14.30
	Carloads	$13.35
50 lb. A Grade English Finish, 25x38-500, untrimmed	4 cases	$14.05
	Carloads	$13.10
20 lb. envelope, 17x22-500, untrimmed	Carloads	$12.40
16 lb. tablet, 17x22-500	Carloads	$11.35

Rag Content Bond—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Extra 100% rag	57.50	58.50
100% rag	49.50	50.50
75% rag	38.00	39.00
50% rag	29.50	30.50
25% rag	24.00	25.00

Rag Content Ledger—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

Extra 100% rag	58.50
100% rag	50.50
85% rag	42.00
75% rag	39.50
50% rag	30.50
25% rag	25.00

Sulphite Bond—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Air dry bond (Watermarked)	20.00	21.00
No. 1 bond (M.F. watermarked)	15.50	16.20
No. 2 bond (M.F. watermarked)	14.90	15.60
Plain bond (M.F. unwatermarked)	14.00	14.60

Sulphite Ledger—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

No. 1, M.F. watermarked	16.50
No. 2, M.F. watermarked	15.90
Plain, M.F. unwatermarked	15.00

Glassine (f.o.b. mill)—

OPS base ceilings (CPR 76):	per cwt.
25 lb. base No. 1 bleached glassine	22.50—
25 lb. base No. 1 bleached greaseproof	20.00—

News—

	per ton
Rolls, Standard (Contract)	123.00 to 126.00
Rolls (Spot)	(Nominal)
Sheets	138.00—

Tissues (Carlots)—

	per ream
White No. 1	1.90—
White No. 2	1.60—
Bleached Anti-Tarnish	2.20—
Colored	2.00—
Anti-Tarnish Kraft	1.80—
Manila	2.00—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.90—
Napkins, full crepe and embossed (12½ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M shts.) per cs.	10.00—
Toilet, Unbleached (M shts.) per cs.	8.00—

Towels

	per case
Bleached	6.80—
Unbleached	5.90—

Wrappings (Kraft)—

OPS ceilings, per cwt., 50 lb. base weight:	per cwt.
Standard wrapping	7.75—
Butchers, counter rolls	8.25—
Standard bag, mill rolls	7.50—
Shipping sack, mill rolls	7.75—
Gumming, mill rolls	8.00—
Asphalting, mill rolls	7.75—
Envelope, mill rolls	9.25—

Convenient make-up, symmetrical runs with "K" Fittings

Due to chamfered entrances and clean threads, "K" screwed fittings are easy to start and draw up. "K" flanged fittings have accurately milled faces and exactly spaced bolt holes, making them convenient to connect. These are advantages which save time and assure tight joints.

Skillful molding and precise machining give "K" Fittings correct angularity, the essential factor of symmetrical runs.

Since we manufacture fittings exclusively, our business depends upon making them satisfactory to plumbing contractors and plant engineers. The success of our efforts is indicated by the numerous plant expansions which have been required to supply the demand for "K" Fittings.

It will pay you to order fittings from distributors who handle the Kuhns line bearing the "K" trade-mark.

K CAST-IRON FITTINGS
3000 SHAPES AND SIZES

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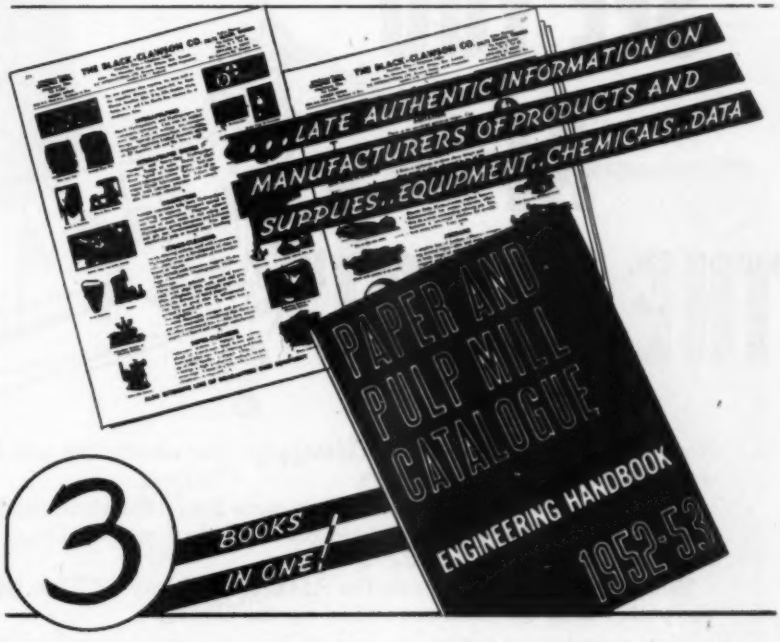
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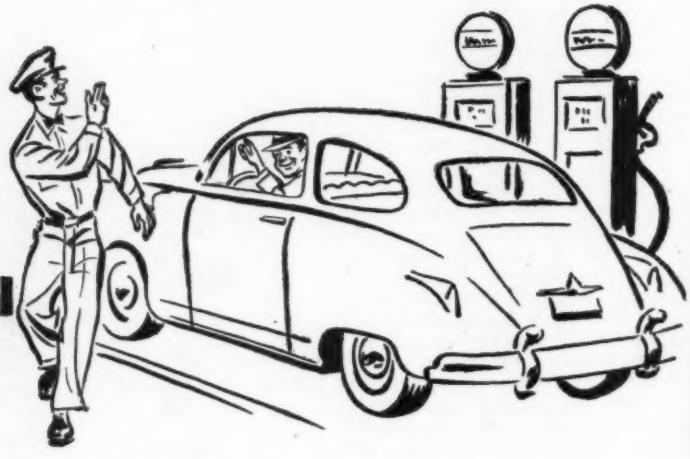
"SEE YOU AT THE POLLS!"

"SEE YOU AT THE POLLS!"



Nobody knows for sure how it started—this line about "See you at the Polls!" we're hearing all over these days.

Best explanation seems to be that it came from that state candidate out west. . . . His opponent in a debate got all riled up and challenged him to fight it out in the alley.

But he said—"I'll settle this the AMERICAN way—I'll see you at the polls!" And the audience picked up the chant.

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Hydrogen Peroxide (U.S.P.)
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Lime
Mayonnaise
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Natural Gas (Corrosive)
Oleic Acid
Oxalic Acid
Paper Pulp Mill Liquors
(Soda and Sulfate or Kraft Processes)
Black Liquor
Green Liquor
White Liquor
Phosphoric Acid (Pure)
Potash Alum
Potassium Hydroxide
Pyroligneous Acid
Pickling Acid—complete information required
Producer Gas (corrosive)
Rayon Solutions (except those containing copper salts and acetic acid)
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Salt (sodium chloride)
Salt Brines
Salty Crude Oils
Sewage
Sludge Acid (Petroleum and Coke By-product)
Soda Ash
Sodium Aluminate
Sodium Bicarbonate
Sodium Carbonate
Sodium Hydroxide
Sodium Silicate
Sodium Sulfide
Sodium Sulfite (neutral or alkaline)
Sour Mash (Distilleries)
Sulfur Chloride
Sulfuric Acid—5% 80°F.
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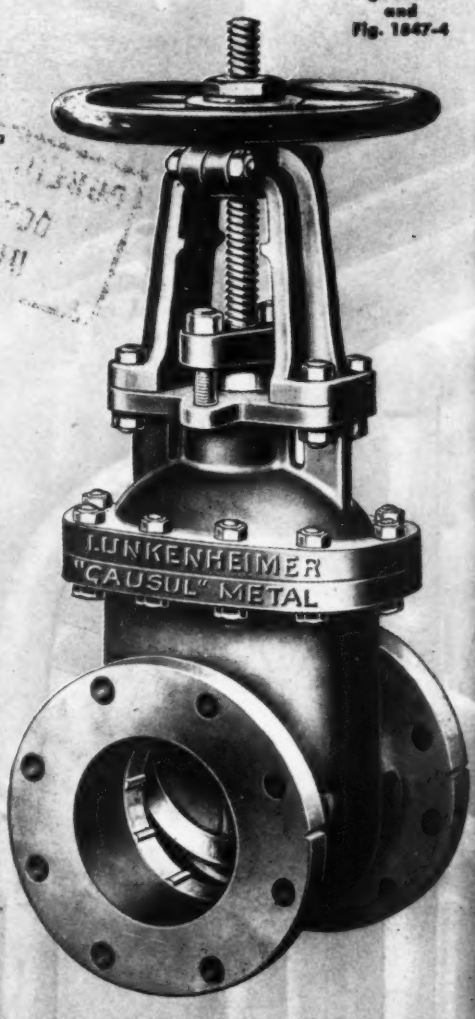

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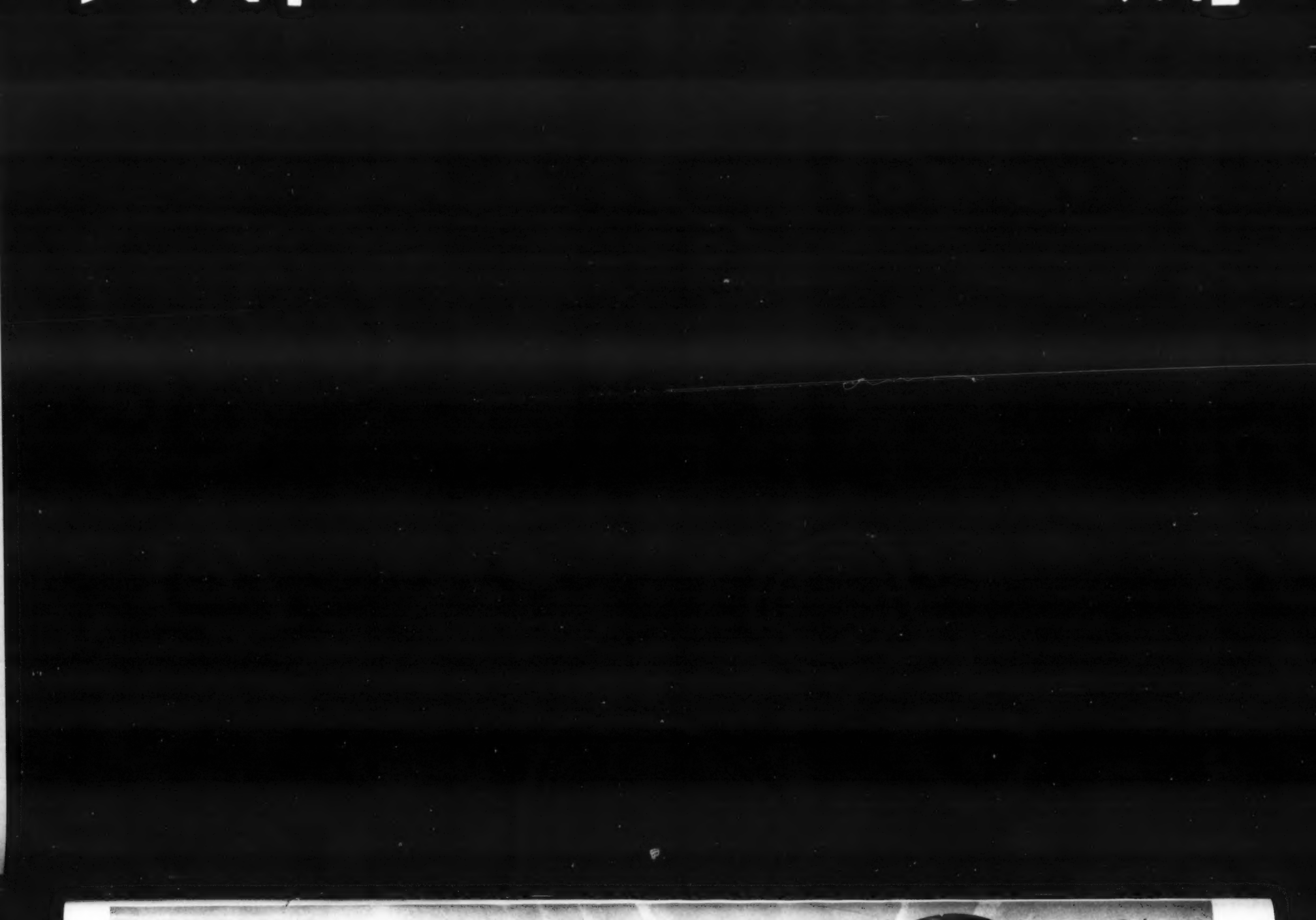
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